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A SERIES OF LETTERS

ADDRESSED TO

HIS ROYAL HIGHNESS THE DUKE OF SUSSEX,

AS PRESIDENT OF THE ROYAL SOCIETY,

REMONSTRATING AGAINST THE CONDUCT OF

THAT LEARNED BODY.

BY

LIEUTENANT-COLONEL EVEREST.

"Well saith Solomon, 'much reading is weariness unto the flesh.' How many hundred studious days and weeks, and how many hard and tearing thoughts, has my little, very little knowledge cost me, and how much infirmity and painfulness to my flesh, increase of painful diseases, and loss of bodily ease and health.

"How much pleasure to myself of other kinds, and how much acceptance with men have I lost by it, which I might easily have had in a more conversant and plausible way of life."—BAXTER'S DYING THOUGHTS.

LONDON:

WILLIAM PICKERING,

1839.

C. WHITTINGHAM, TOOKS COURT, CHANCERY LANE, LONDON.

PREFACE.

To expect that the public in general will interest themselves in a polemical discussion on subjects of abstract science, is, I am aware, unreasonable; yet perhaps there may not be wanting those who, on the bare principle of justice, will consent to peruse the present series of letters; and who make it the rule of their lives to frown down the strong when combining to oppress the weak and the absent.

To such persons I address myself—I ask no advocate—I court no favour; I complain of wrong inflicted by a body of men, powerful from their influence, their learning, their rank; and all that I ask is a fair and impartial hearing.

A SERIES OF LETTERS

ADDRESSED TO HIS ROYAL HIGHNESS THE DUKE OF SUSSEX.

LETTER I.

"Semper ego auditor tantum? nunquam ne reponam?"

MAY IT PLEASE YOUR ROYAL HIGHNESS,

A PAMPHLET has recently fallen under my eye written by Major Jervis, of the Hon. E. I. Company's Bombay Engineers, with which is bound up, amongst several other documents, one purporting to be an Address to the Chairman, Deputy Chairman, and The Honourable the Court of Directors of the E. I. Company, bearing the signatures of many of my countrymen most distinguished for their attainments in science, and at the head of them that of your Royal Highness as President of the Royal Society.

The pamphlet and documents to which I allude bear upon subjects in which I am most intimately concerned, and therefore I have made bold to address your Royal Highness; but previously to entering on my subject, it is but consistent with the deference which I owe to your high rank that I should explain who I am, and on what grounds I deem myself warranted in thus intruding myself, uncalled for, on your august presence.

I am a Lieutenant-Colonel in the Hon. E. I. Company's Bengal Artillery, and was appointed by the Marquis of Hastings, in

1817, to be chief assistant to the late Lieut.-Col. Lambton, of H. M. 33rd Foot, who had for many years been occupied in the extensive series of Geodetical operations, known by the designation of the Great Trigonometrical Survey of India.

I joined Lieut.-Col. Lambton in 1818, and remained with him as his chief assistant until his death in 1823, when I was appointed his successor, and since that period have continued to hold the situation of Superintendent of the Great Trigonometrical Survey.

Your Royal Highness will understand, that the meridian of India, which runs nearly through Cape Comorin, at a place called Punnæ, in latitude 8° 9′ 32″, and longitude 77° 39′, is that along which meridional arcs have been measured; for the partial measurements made prior to these were rejected by Lieut.-Col. Lambton himself, and never adverted to by him in his latter days but as failures. Men quote these rejected measurements now and then, it is true, but it is not correct to do so.

The principal meridian of India is then that of which I speak, and the series of triangles conducted along it, is designated accordingly the Great Arc Series. Along this meridian, at the time of my succeeding to Lieut.-Col. Lambton, arcs had been measured from Punnæ, in latitude 8° 9′ 32″, to Damargida, in latitude 18° 3′ 23″; their particulars had been published in divers works, but chiefly in the Transactions of the Asiatic Society of Calcutta; several bases had been measured with a steel chain at intermediate sites, besides one at each of the limits; astronomical observations had been taken with a zenith sector, sufficient to determine the celestial arcs of amplitude, either of the arc as a whole, or in portions; and in fact, in the opinion of the Lieut.-Col., nothing remained to the completion of the meridional arc of near ten degrees, comprised between Punnæ and Damargida.

At the period of which I speak, January 1823, the Great Arc Series of India had also been partially continued to the northward of Damargida; the principal triangles had been brought up to the

line Pilkher, to Ikjhera, in latitude 20° 29′; a base of verification had been measured with a steel chain in the valley of Berar, in latitude 21° 6′; and an attempt had been made by Lieut.-Col. Lambton to complete a series of celestial observations at Takalkhera, in the same latitude, with the same zenith sector already spoken of; but the connexion between this new base and that at Damargida was not formed, for there was a gap of nearly fifty miles remaining to the south of Takalkhera, in which not even the stations were chosen; and as to the celestial observations themselves, the wildness and uncertainty which prevailed throughout those at Takalkhera were such, as to render them totally unsusceptible of any arrangement or reduction to order, without resorting to arbitrary alterations, which I could never think warrantable. Men cannot last for ever: the Lieut.-Col's. infirmities had evidently subdued all but his spirit, at the time of this his last effort.

As to the terrestrial work, as far as it went, that is, to the line Pilkher to Ikjhera, I was necessitated by existing circumstances, to take it for the time being as it stood, for better, for worse. I succeeded to no ordinary man, and before proceeding to impugn or revise anything that had been performed during his superintendence, it behoved me to shew that I was at least able to do as well as he had done.

I therefore availed myself of the earliest occasion to take up the line Pilkher to Ikjhera, and fill up the connexion between it and the new base. At Takalkhera, I made a sufficient number of celestial observations to determine the arc of amplitude, and then proceeded to push the triangulation northwards, to the latitude of 24° 7′, near which, in the valley of Sironj, I measured another base of verification with the steel chain, and at a station called Kalianpur, made another complete set of observations for amplitude.

This work was brought to as satisfactory a conclusion as I could have anticipated in 1825. Nothing was therefore left undone, to connect the series between Damargida, in latitude 18° 3′, and

Kalianpur, in latitude 24° 7′, and I should probably have continued the work to the northern extremity of the E. I. Company's dominions in 1825, but for the state of my health, which forced me to return to my native climate.

An account of all that I had done was printed by me at the expense of the E. I. Company in 1830, and one copy of the book was, I am assured, given to the Royal Society; but whether or no, I myself distributed several copies, which the Honourable Court placed at my disposal, to gentlemen of my acquaintance; and amongst the distinguished names that appear appended to the address bound up in Major Jervis's pamphlet, I recognize more than one to whom the humble tribute of my labours was offered.

If then in that Address I find myself treated as a thing gone by, and unworthy of further note, your Royal Highness will assuredly admit that I have just cause to complain; and though there are certainly no direct symptoms of positive disrespect, where my former labours are alluded to, yet to my present labours, in which I have been unremittingly engaged since my return to India in 1830, and am still hourly occupied, not only is no allusion made, but the gentleman selected by my employers, to succeed only *eventually*, and in *case of my being compelled by ill health to leave India*, is spoken of as already installed, and I as out of office.

To your Royal Highness I submit that I should have a peculiar right of appeal in such a case as this, if I succeed in showing that it is of this nature: I am a brother Mason, one of your Royal Brother's lodge, the Prince of Wales's Chapter, of which your Royal Highness may easily assure yourself, by reference to brother Harper, if he be still alive, or to the existing Secretary. Then, please your Royal Highness, if Masonry do not merit all the imputations and sneers which its enemies would heap upon it, (a day which I hope I may never live to see,) it is the bounden duty of your Royal Highness to protect an absent brother Mason from wrong.

But I keep in mind, that I have first to show that wrong has been inflicted, towards the establishment of which fact it is necessary that I should refer to the Address itself, which, to avoid confusion, had better be reserved for my next letter.

I have the honour to be, &c. &c.

GEORGE EVEREST.

LETTER II.

" Good name in man and woman, dear my lord,
Is the immediate jewel of their soul;
Who steals my purse steals trash; 'tis something, nothing,
'Twas mine, 'tis his, and has been slave to thousands;
But he who filches from me my good name,
Robs me of that which not enriches him,
And makes me poor indeed." MOOR OF VENICE.

MAY IT PLEASE YOUR ROYAL HIGHNESS,

IN my last letter I proposed to refer to the Address of the Royal Society, which bears the signatures of no fewer than thirty-eight of the Fellows of that learned body, preceded by that of your Royal Highness as their President; and to proceed in order, I will beg leave to extract the first paragraph, which runs thus:

" We the undersigned, the President, Vice President, and Fellows of the Royal Society, the Geological Society, and the Royal Geographical Society, respectively, view with great interest the important objects which Major Jervis, F. R. S. (who, we are given to understand, has recently been appointed by the Honourable Court to the charge and superintendence of the Great Survey of India) has submitted to us for the extension of science; the improvement of the geography of India, and of the countries stretching between its frontiers and the Caspian Sea;

which last object has been particularly advocated by the Council of the Royal Geographical Society."

In reference to which, I beg to remark that the circumstance on which the learned Fellows base this paragraph of the Address, is so obviously incompatible with my continuance in my present situation, that, considering I am one of their body, who have had no bed of down to recline on in following up my pursuits, (be their value what it may), it would but have been commonly civil and decorous, to dispose of me decently before thus heedlessly assuming that I am set aside to make room for a successor.

But as the difference of data seems to be the chief cause of difference of opinion amongst men, and since there is no hope of an end to any controversy in which the antagonists do not thoroughly understand each what the other means, therefore, perhaps, your Royal Highness will graciously permit me to narrate the true state of the case as it stands.

In the year 1829, the Honourable Court of Directors did me the honour to nominate me to the vacant office of Surveyor-General of India, connecting therewith that of Superintendent of their Great Trigonometrical Survey, which latter, the flattering compliment had been paid to me, of keeping open during my absence of five years on sick leave.

I left England in June 1830, and arrived in India in October of the same year, to take charge of my new and former situations, in the duties of which I have been, and am to this hour, unremittingly employed.

Certain matters relating to a longitudinal series which had been carried on by my assistants during my absence; to old arrears of business of the Great Trigonometrical Survey, connected with work performed by my predecessor and myself, which had been left unfinished in consequence of my illness; to the comparisons of the new compensation bars, and the iron standard, with the old Great Trigonometrical Survey and other chains; and many other preparatory measures, which it is not necessary to explain in this place, combined to detain me in

Calcutta, and prevent my resuming operations on the great arc series till the beginning of 1833, when I proceeded to the upper provinces of India for that purpose.

Your Royal Highness will understand, that at the time I speak of, there was not a single person at my disposal who had had the slightest experience in Geodetical operations, except three of my sub-assistants, who were not scientific men; these three were all, more or less, able to observe (one of them, Mr. Olliver, with accuracy) in the olden method; but the instruments which I brought out with me to India in 1830, were so vastly superior to any that had ever been before used, that what would have sufficed in former days in point of accuracy, could not be taken as a criterion for what would henceforward be expected by my employers.

But not to particularize the novelty of the new instruments for observing, and of the signals used, or the corresponding attention now about to be required to minutiæ, which were formerly treated as rejectaneous, there was, in the portion of the Great Arc lying to the north of the parallel of 24° 7′, a natural source of embarrassment, presented by the face of the country itself, which rendered all experience formerly acquired by these persons of no avail whatever.

Near Bhartpúr, in latitude 27° 14′, is the Hill Station of Madoni, the last natural height which occurs on the eastern flank of the series, for upwards of 215 miles of direct distance, so that in proceeding further northward, the stations were to be fixed in lands presenting absolutely a dead flat.

At Dehli, in latitude 28° 41′, is the last natural height on the western flank of the series, further north than which, all the stations on both flanks were necessarily to be fixed in the same undeviating plain for upwards of 100 miles.

I fear I shall hardly make myself intelligible to your Royal Highness, for it requires that a person should have been practically engaged in Geodetical pursuits, in order fully to appreciate the wide difference that exists between operations carried on in

hilly countries, and those conducted under the circumstances I speak of.

It would lead me a great deal into verbiage, to endeavour to explain this difference satisfactorily; and as I shall probably eventually find it necessary to do so at full length when my next work comes forth, perhaps your Royal Highness will, in the mean time, permit me to assume as a fact, that the difference is so very wide, that people trained only in countries where natural heights abound, are utterly confounded when deprived of those accessories.

True it is, no doubt, that if all sorts of angles and sides are made use of unscrupulously, a series of triangles can be carried on in one sort of country nearly as well as another; and I am aware that M. Mechain, in speaking of the wonderful powers of the repeating circle, declares it to be no longer necessary to have "triangles bien conditionnés;" but that is not the style in which I would consent to carry on work deputed to my management, and as I am not a convert to the opinion of this learned and able Geodist, but on the contrary deem symmetry quite indispensable to accuracy, therefore I have established it as a rule, never to be departed from, that no angle less than 30°, or greater than 90°, is to be admitted into a simple series; and as when the person at the head of a department issues a rule or ordinance for the general guidance of his subordinates, he ought to be the first to set an example of compliance with it, and the very last to violate it, therefore this privilege of setting symmetry aside was of no more avail to me, than was the experience of those who were sufficiently calculated to make themselves useful in hilly tracts.

Hence, admitting these premises, it will be plain to your Royal Highness, that to the north of Bhartpúr, the conduct of all the minutiæ of the whole work rested entirely with me: I was to devise new methods, make myself proficient in them, and then instruct my subordinates in them; and it will serve to illustrate the nature of the embarrassment, that the old assistants were the last to be of use, and the most difficult to be instructed, just in

the same manner as bad habits acquired in practising the violin, only retard the progress of the learner. Nay, moreover, to this hour, of the three persons I allude to, only the youngest of the three, Mr. J. Peyton, has ever become a proficient in the use of the new instruments, and new methods; whilst Lieuts. Waugh, Renny, and Jones, of the Bengal Engineers, and many others of my subordinates, who have all been pupils of my own since 1832, have attained a degree of accuracy, and perfection of skill, which it would be difficult to equal, and, as I conceive, impossible to surpass: so true is the old adage, that " you cannot teach old birds to sing."

By the middle of 1833, it had become quite clear that there was no hope of making any progress unless I took the field myself, which I accordingly did on the 1st of November of that year, and by the end of the following April I succeeded in selecting all the stations, furnished the architects with drawings and other requisite instructions illustrative of the size and height of the towers to be erected, (seventeen in number), measured all the angles to within a few seconds of the truth, and traced out the site of a base line in the valley called the Dehra Dún.

The distance between Sironj and Dehra Dún is about 450 miles, and the labour was tremendous. In the close of 1834, I commenced the measurement of the base of verification, which, until my subordinates were instructed, was also another serious labour, falling chiefly on me; and the combined action of so much fatigue and mental anxiety brought on an illness which well nigh closed my worldly affairs in the most compendious of manners.

In short, by the end of 1835, medical gentlemen pronounced my recovery past all hope, unless I quitted India immediately; and certified the same in writing, which I laid before the Government, and, as a precautionary measure, obtained their full sanction to use my own judgment as to staying, or going to Calcutta with a view to embarking.

Though, however, eventually I got the better of the illness, yet in the meantime the knowledge of the precarious state of my health had been communicated to the Court of Directors, who, desirous above all things that a work in which they take so much pride should not be impeded, searched for a successor for me, and selected Major Jervis, but decided at the same time, that "so long as I remained in office, they must look to me alone as their responsible adviser, in all matters connected with the survey of India;" and further paid me the handsome compliment of saying, that "although under the apprehension that my health would compel my early return to England, they, in September 1837, made a provisional appointment of a successor, yet as they had not since received tidings confirmatory of that apprehension, they were in hopes that the Government would have the prolonged advantage of my services."

This, please your Royal Highness, is the accurate state of the case, which can be substantiated, if necessary, by reference to my office documents and other writings in my possession, and I need not point out how utterly at variance it is with that assumed as the basis of the Address of the Royal Society.

I need not surely demonstrate to that learned Society, that if two bodies, A and B, exist in two points of space, which are not susceptible of simultaneous occupation, then in order that B may take possession of the point which A holds, two events, a and b, must occur in succession, the first in order of which, a, must precede, and consists in the elimination of A, whilst b, which is to follow, and can never happen until a has happened, consists in the transfer of B to the locality of A.

Now I leave learned gentlemen to calculate the probability of the occurrence of b; but, when they assume that the probability is unity, I submit to your Royal Highness, that they take a step inconsistent with the rigorous method hitherto deemed necessary by those who professedly cultivate the exact sciences.

It may perhaps be urged, that the learned Fellows, whose names are appended to the Address, were *informed* that Major

Jervis had been appointed to the charge which I have held for so many years, and that I was actually removed to make room for him by expulsion,—by death,—by incapacity,—by sickness,—by disinclination,—or some other cause; but, please your Royal Highness, this is not the mode in which reasonable beings usually proceed, nor would it be deemed justifiable, in excuse for an indiscretion in common life, to advance vague reports and surmises, or tales narrated by interested intelligencers, as the foundation of our actions. Now, if indiscretions of this nature are so avowedly inexcusable in common men, by how much more are they unbecoming in the learned, the wise, the gifted of a nation, to whom the more humble and less fortunate of their countrymen ought naturally to look up as a guide and example.

Suffer me, please your Royal Highness, without fear of being deemed presumptuous, to entreat each of those learned addressors individually to make my case his own; and if, as it cannot be doubted, he have a sufficient portion of the spirit of Christianity and justice, to place himself in imagination in my position, let me then ask him, how he would like the unceremonious mode of disposal which he has participated in towards me to be applied to himself?

There are, perhaps, but few of the thirty-eight learned Fellows whose circumstances exhibit an exact parity with my own; but still there are sufficient approaches to that state, to enable many of those learned persons to estimate the feeling of indignation which each would experience individually, at so free and easy a process of concluding on his dispossession; for the case divested of all its incumbrances, stands precisely thus:—

The Court of Directors of the E. I. Company are the body formally recognized by the law of the land as entitled to govern the vast dominions of India which own the sway of Great Britain. It matters not to the question, whether the law be wrong, or right; for its enactments are just as forcible as those by which her present Majesty sits on the throne of her ancestors.

The Court of Directors have the power, therefore, by law, to appoint whom they choose to be Surveyor-General of India. I am the person whom they have been pleased to nominate; and I am just as legally the guardian of the department entrusted to my charge, as Professor Airy is of the Royal Observatory, as Col. Colby is of the Great Trigonometrical Survey of Great Britain and Ireland, as Col. Pasley is of the Institution at Chatham, as Capt. Beaufort is of that of Hydrographer to the Admiralty. My capacity or incapacity is nothing whatever to the question; and though I shall have no objection to make that a subject of discussion with those who desire it, in proper time and place, yet for the case under present consideration, it matters not if I be the most incapable person alive, so long as my masters shall do me the honour to confide in me.

Here, then, I submit to your Royal Highness, are cases very nearly approaching to the parity desired by way of illustration and analogy; for, omitting Colonels Pasley and Colby, (whose names I beg with all deference to apologize to these gentlemen for having cited, seeing that they are not in the thirty-eight), let me ask the learned Professor and the gallant Captain how either of them would like being thus unceremoniously assumed to be thrust off his seat, because he had had the calamity to incur a serious illness in the execution of his office? Is that the way in which we usually make our return to men who unsparingly expose their lives, their health, their comfort, and every thing that tends to make existence worth possessing?

Formerly, it was a proud saying, that the English were a generous people,—that they had too much manhood to wrong the absent; and is the national character so much deteriorated now, that a man's absence is to be made a plea for setting him aside in this cold-hearted spirit of displacement and indifference, which would not be exercised towards him if present.

Please your Royal Highness, I turn in vain to search for any cause to palliate, for any ground on which to defend, so palpable a breach of the duty between man and man; but, when I

further remember that I am myself a Fellow of the Royal Society, and that it is one of their own body against whom this causeless offence has been committed, I drop the attempt as hopeless.

There may be those who will urge that the distance between England and her Indian possessions is so great, that it is difficult to acquire accurate intelligence; but I beg it may be remarked, that this distance only adds another hardship to those inseparable from my situation, and one more corresponding claim on the sympathy and considerate regard of those who profess to be my fellow votaries at the shrine of science.

There may be others who will advance, that they have no information of my proceedings; that I publish nothing, and that they are in a state of ignorance of what I am about; but is there one who will come forward and say, that he ever asked for information which I evinced a disinclination to afford?

Positively there is not, cannot be one; and that the information *which is not worth asking for is not worth having*, is a truth too trite to need that I should dwell on it.

I was in Europe in 1826—1830, and passed a considerable portion of that period in England, where I became personally acquainted with several of the thirty-eight learned Fellows who have signed the Address. Who of these learned men ever applied to me in that period for information, or expressed the slightest interest in the operations of the Great Trigonometrical Survey of India, of which I was then, as I am now, known to be the chief? Omitting Professors Airy and Hamilton, who have, I allow, spoken a few words incidentally on that subject, there was not, please your Royal Highness, one of the whole thirty-eight who did not appear to look on the subject just in the same manner as if he were under the tuition of that jocose gentleman, Theodore Hook, so celebrated for diverting himself and his readers at the expense of India, and all connected with it.

There are, however, not wanting those of whom our country may well be proud, (though their names are not included in those appended to the Address,) sufficient to clear me of the

charge of reluctance to talk in proper time and place regarding my own professional pursuits; and, such being the case, this support, which might be brought forward to hang a defence on, falls to the ground like a broken reed.

The late Mr. Edward Troughton and Capt. Kater, for example, if they had been alive, would certainly have been willing to step forward in such a case; and perhaps Mr. Babbage, if his recollection of me be no more impaired by time than mine is of him, will assure your Royal Highness, that I am far from an uncommunicative person to those who show a desire to attend to me.

But the instinctive reluctance which I feel to intruding information where it is neither prized nor wanted; my settled aversion to jumping at conclusions, over the heads of facts; the constant impulse which is within me to perform my work first, and talk about it afterwards, and to consider nothing accomplished of my task whilst any portion remains undone and uncertain; these, if learned gentlemen please so to term them, may be features of my idiosyncracy, but certainly cannot be adduced as arguments for omitting towards me the common forms of civility, which each and all of them would consider indispensable in his own case.

The origin then must be sought for elsewhere; and it is evident to my mind, and I think it will be made clear to that of your Royal Highness, that it is assignable to the following causes:

First. The habitual spirit of selfishness and monopoly of the Royal Society, which prompts that body perpetually to form a little clique, knot, or coterie of a particular set at their head, within the compass of which all is gold—pure refined gold—without it all dross—mere dross.

Second. The action of self-sufficiency on an indifference—sublime, without parallel in comparison with that of any other learned body in Europe, or America—to the actual state of society and natural features of that vast country in the East, which owns the sway of Great Britain.

Now with regard to the first of these, I shall, with your Royal Highness's permission, refer to a celebrated Treatise on the Decline of Science in England, by no less a person than Mr. Babbage, to which I will add some other little facts of my own in an ensuing letter; and as to the second, the first principle which I have specified, has the evident tendency of persuading those who are subject to its influence that they know all about a matter of which they in fact know nothing, and thus inducing them to arrogate to themselves a sort of patent for universal and intuitive insight; whilst its particular operation in the case before us is to blind the learned body to the labours and performances of their own countrymen in the East, which they are in consequence as unwilling as unable to appreciate.

I may be altogether wrong in these suppositions, and in that case shall be very thankful to those who will set me to rights; for of all things, that which I would most seek to avoid, is to do injustice in act or word to any man, or set of men, particularly my own countrymen; wherefore the learned gentlemen may rest perfectly assured, that I have no desire to vie with them in their oversight of the common courtesies of life, but am content to leave them in full and undivided possession of all the renown that may result from such a procedure.

I have the honour to be, &c. &c.

George Everest.

LETTER III.

" The Scian and the Teian muse,
The hero's harp, the lover's lute,
Have found that fame your shores refuse;
Their place of birth alone is mute
To sounds which echo farther west,
Than your sire's ' Islands of the blest. "

BYRON.

MAY IT PLEASE YOUR ROYAL HIGHNESS,

In my last letter I promised to add some little facts of my own, illustrative of the habitual spirit of monopoly and selfishness of the Royal Society, and of the tendency of that spirit to blind the learned Fellows to the labours and performances of their own countrymen in the East, which they are as unwilling as unable to appreciate; and as it would not be consistent with the deference which I owe to your Royal Highness to leave my pledge unredeemed, I shall begin with a short account of the bearing which the career of my honoured predecessor, the late Lieut.-Col. Lambton, has on that question.

At the time of my joining the Lieut.-Col. at Hydrabad, in 1818, he gave to both Mr. Voysey and myself a general invitation to his house: we were his constant guests, and formed part of his family, in fact; nay, we constituted his domestic circle, and were of the very few with whom he discoursed familiarly, and without restraint. My knowledge, therefore, of many circumstances connected with the bygone days of our common profession, is drawn from the fountain-head, and, as far as La Place's rules respecting evidence are conceded, is entitled to just that portion

of weight which the learned Fellows may be pleased to compute as its due, but it goes to substantiate the following narrative:

Lieut.-Col. Lambton commenced the Great Trigonometrical Survey of India in 1799, and up to the period when the allied armies occupied Paris, he never received from the Royal Society one word of encouragement,—of sympathy,—of assistance,—of advice.

Up to that period, the only learned Englishmen who ever noticed him, or seemed to think him deserving of a moment's thought, or his labours as meriting a passing comment, were the Rev. N. Maskelyne, and the late Professor Playfair; of whom, the former gentleman addressed him by letter, and the latter made his labours a subject of discussion in some of the ablest articles of the Edinburgh Review.

Up to that period, none of the proceedings on the Great Arc of India, or the perpendicular arcs, or on the operations more purely geographical and topographical, were ever published in the Transactions of the Royal Society. They were given to the world, as is well known, through the pages of a provincial society, known by the name of the Asiatic Society of Calcutta; and only those who had the discernment to appreciate the real merit and sterling value of such labours, deemed themselves repaid by the search for them in volumes emanating from so obscure a quarter of the globe.

To this moment I remember well the gleam of gladness with which my old master used to refer to the fact of Nevil Maskelyne's letter. It had reached him apparently in an appropriate hour, when he was surrounded with difficulties,—had few supporters, and many opponents, and, what is worse, when he was in vain endeavouring to impress the nature and utility of his operations on the local Government, eager for economy, of the country where they were carried on; for in such cases, it is necessary to lay all technicalities aside, and dress all explanations in the language of official intercourse and common parlance. The late Lieut.-Col. used to dwell on this letter as the event which had

most cheered him under all his toils; for with this solitary exception, until Professor Playfair took the subject up, and canvassed it in his well-known masterly style, he was to appearance forsaken of all, and left to struggle alone with the current, whilst his labours were treated by all his countrymen, who professed to be his fellow votaries at the shrine of science, with the most superlative indifference and neglect.

There were two assistants prior to this period with the late superintendent, Captains Kater and Warren, both of H. M. army, of whom, the former gentleman subsequently became too well known to need anything that I can say regarding him. The latter was a gentleman of French extraction, and connected, as it seems, with the old noblesse of that country, his family having been of those who emigrated in the intestine troubles of the Revolution.

Hence when the allied armies entered Paris, and the new regime gave place to the old, under the revived dynasty of the Bourbons, the way seemed opened to Capt. Warren to re-establish his family pretensions; in consequence of which, on the arrival of the intelligence of the new state of things, he proceeded to Europe, and shortly afterwards made his appearance at Paris.

Here he soon found not only that he was no stranger, but that his acquaintance was eagerly courted by the learned men of the day, particularly the late M. De Lambre, who was familiar with the Geodetical Operations of India, and the names of Lambton and himself,—that great man and others of his class not having deemed it beneath them to search through the pages of the obscure provincial Society of Calcutta, and the articles of the Edinburgh Review; and many were the questions which he put regarding the man who had contended so well, so ably, and so long, with the difficulties of a foreign land, and an alien people; and much must he have been surprised and shocked at the supine inattention of learned gentlemen in England to one so well deserving of their countenance, and who reflected such high honour on the nation, and on the army of the reigning sovereign.

In the course of the conversation of Capt. Warren with M. De Lambre, the latter, it appears, asked whether Lieut.-Col. Lambton would like to be a Corresponding Member of the Institute; and on receiving an answer in the affirmative, and being assured that he would certainly consider it as a very high and gratifying compliment, the diploma was forthwith made out by unanimous consent, and under cover of a very flattering letter from M. De Lambre, was sent to India, where it reached the Lieut.-Col. not very long prior to my joining him at Hydrabad in 1818.

Shortly after this affair at Paris, Capt. Warren went to London, and as he was apparently not a person of much reserve, the whole story soon got into circulation, when the contrast presented was really too striking even for the Royal Society to sit quiet under; so, having taken the prudent precaution to ascertain whether the Lieut.-Colonel's bankers would pay his fees of entrance and subscription, they too followed in the train of the Institute, and elected the great man a Fellow of their body. The date of this latter event will of course be ascertainable from a reference to the records of the Society; to the best of my remembrance, the Lieut.-Colonel's election took place in 1817-8, after eighteen to nineteen years of toil in this land of pagans and aliens.

An event of this kind, which was recent when I and Mr. Voysey first formed Lieut.-Col. Lambton's acquaintance, was manifestly not calculated to enhance the esteem which either of us felt for the Royal Society. It was familiarly known to both of us, and to the late Dr. Lamb of the E. I. Company's service; but with the exception of us three, I am not certain that it was ever spoken of to any person; if there be a fourth, Mr. Henry Russel, who was then the British Resident at Hydrabad, and was also on terms of intimacy with the Lieut.-Col., is the most likely person, if his memory serves him, to be able to substantiate this narrative.

And now, please your Royal Highness, what are we to think of the Society, within whose walls he who first started the doctrine of the figure of the earth, presided?

Newton, Maclaurin, Thomas Simpson, the three names most

celebrated in connexion with the homogeneous figure, were Englishmen; and was it more becoming in the English nation and the Royal Society to abandon this beautiful indigenous branch of science to its fate, than to investigate it practically?

Let us examine what our neighbours across the channel did,—we may be assured whatever it was, that it was the exact reverse of what the English did. That gallant and chivalrous nation found the doctrine of Newton totally impugned the theories of their favourite Descartes; in spite of which they had the wit to discern that it had truth on its side, and as those amongst whom it was propagated, and with whom the *onus probandi* rested, had thrown it aside with the indifference so peculiarly characteristic of the Royal Society, they took it up, and fitted out expeditions to the equator and polar circle, besides incurring the trouble and expense of carrying a series of meridional triangles through France.

I am writing in camp, and far from my head-quarters and library, and therefore your Royal Highness will graciously excuse me, if, in citing from memory, I should inadvertently commit small errors in dates. It was I think in 1735, that M. M. Godin, Bonguer, and De la Condamine, set out on their equatorial expedition, and about the same time that M. M. Clairaut, Maupertius, Camus, Le Mounier, and Celsius, went to Torneo and Kittis; whilst it was not till 1790, that the English nation ever stirred hand, foot, or head in the affair, in which they preceded the Court of Directors of the E. I. Company by only nine years.

It is wrong to say, as Major Jervis has done (vide page 14, of his Address at the eighth Meeting of the British Association), that the large theodolite was sent as a present to the Emperor of China; the fact is otherwise. The large theodolite was constructed by Ramsden to the order of the E. I. Company, for the Trigonometrical Survey of India, and on account of some enhancement of price for improvements introduced without their previous consent, by the maker, was thrown on his hands, and

purchased by the late Col. Twiss, of the Board of Ordnance: but the Court speedily had a fac-simile of this very instrument made by Cary, the identical one referred to in my book, pp. 45-6, and which, if my recollection serves me rightly, was taken in its passage to India by the Pièmontaise French frigate, landed at the Mauritius, then a French possession, and gallantly forwarded on to its destination by De Caen, the governor, with a complimentary letter to the Government of Madras.

Hence then, considering the supineness and long lethargy in which the Royal Society had indulged with regard to this question, so interesting to mankind at large, so peculiarly interesting to them, as it might naturally have been presumed to be from its indigenity,—it might have been supposed, that when at last they aroused themselves from their trance, they would have considered it incumbent on them to make some amends, and to show that their indifference was not assignable to any want of sensitiveness to the national character, or a reluctance to appreciate the labours of their own countrymen in whatever part of the planet they were carried on.

Those who had formed such an expectation, however, may now undeceive themselves; and as, without being one of their number, I still was unwilling lightly to abandon any portion of my respect for an assembly which I had looked up to from my early youth as the receptacle of all that was most learned and respectable among my countrymen, I attributed the neglect which my predecessor had experienced, to the circumstance of his having omitted to comply with prescribed forms; and consoled myself with the reflection, that if he had timely taken the precaution to have himself enrolled as one of the fraternity, the treatment he would have met with would have been of a different order.

In this view of the case, I resolved when I was in England, in 1826, to leave no forms unattended to. I found no difficulty of admission. My friend Capt. Kater proposed me: there was no want of other learned men to second his proposition. I was

elected without opposition, and took my seat, deeming it a sufficient honour to be allowed to sit within the walls which had been honoured by the presence of a Newton, a Bradley, a Brook Taylor, and a Waring.

But, please your Royal Highness, in as far as I could see or learn, the Council of this august body seemed to be perpetually involved in angry squabbles and discussions about jobs and matters of patronage, *hard words, jealousies, and fears;* and, instead of a quiet philosophical assembly, each individual of which was steadily bent on pursuing his own favourite branch of science, and revealing the results of his experiments, investigations, and inquiries to his associates, I could remark little else than bickerings, reciprocal accusations of trickery and imposition; men of no merit or acquirement thrust into high posts; the first philosophers of our land living retired and almost unnoticed and unknown; whilst a total absence of all genuine love of science (except where one of the self-elected coterie was connected with it), seemed to be the prevalent feature.

In such a falling-off from what my imagination had taught me to expect, it will be evident that I could have no disposition to be over-communicative. Having no desire to participate either in jobs or squabbles, I sat a silent observer, and studiously kept aloof, whilst the learned Fellows *played their fantastic tricks before high Heaven;* and as I sought no friends, so I sedulously avoided every procedure which could make unto me enemies. But I still hoped, especially after the severe lashings which had with such bounteous profusion been dealt out by Mr. Babbage and Mr. Daniel, that the learned gentlemen would have had the good sense to forbear to trespass irregularly on the domain of which I am guardian; and that the circumstance of my being now one of themselves, in name at least, would have alarmed the pride of one and all, at seeing an act of rudeness or indignity perpetrated towards me in my absence in a far distant land, which none would have ventured on if I had been present, and which none would have silently endured in his own case.

It will be seen from the premises deducible from the foregoing narrative, that the burden of maintaining the national character in matters where Geodesy, in its bearing on the question of the figure of the earth, is concerned, has chiefly devolved on the E. I. Company since the year 1799; for without meaning to arrogate to the operations of India any undue claim on the score of accuracy, in which respect I may legitimately assume that they are on a par with others, the fortuitous circumstance of the greater extent of unbroken meridian presented by this than any other country which has yet been the scene of such operations, is in itself a decidedly preponderating advantage.

For example, Col. Lambton's station of Punnæ, which is the southernmost of the Great Arc, is in latitude 8° 9′, whilst my station of Kaliana is in latitude 29° 31′, nearly, which gives a total amplitude of about 21° 22′. It has been a subject of discussion, to connect Ceylon as far as Donder Head with the great arc series, but this would not be an unbroken meridian; and it has also been contemplated as a possible occurrence, to continue the series across the Himalaya mountains, (provided it be practicable to pass that snowy wall), which would, if desirable, give a far greater extent, limited in fact only by such obstacles as the different forms of society in the intervening hordes, and the features of the country might present.

The very circumstance, however, of these bold projects being entertained, when combined with all that has been actually accomplished at the sole expense of the E. I. Company, is sufficient, I presume, to establish what I have just advanced; and in the meantime, let me beg permission to inquire into what the Royal Society have ever been instrumental to at all in keeping with this?

The colonial possessions of Great Britain furnish a field to the full as extensive as, if not much more so than, those of the E. I. Company. New Holland, for example, the Cape of Good Hope, or, if the Royal Society thought the example of their continental neighbours not unworthy of them to follow, Cape Horn, and

South America, afford as expanded a theatre as the most energetic could desire. Why have no attempts been made to carry a meridional series through such countries as these? Seeing, particularly that in as far as the southern hemisphere is concerned, data are of more urgent necessity than in the northern, on account of the comparative abundance of the latter, and paucity of the former, if an arc equal in extent to that between Punnæ and Kaliana could be measured, it would be really a boon of no small magnitude, and throw a light incalculably great on the true figure of the earth.

Are the Royal Society not aware that I brought forward, so far back as 1820, strong facts of locality to impugn the validity of De La Caille's operations at the Cape of Good Hope, which supply the only datum referable to the southern hemisphere?

I know that Professor Airy has objected to my conclusion; but with all due deference to the learned Professor, that only reduces the question to a matter of opinion against opinion, which can manifestly never be settled by hypothesis, or by any method short of actual trial, in circumstances where the two limits of the section are free from all palpable cause of disturbance by lateral attraction.

Why, may I ask, after having displayed for so many years so unphilosophical a disregard of all that it is in their own province to do, and of all that the E. I. Company have done, do the learned body suddenly start up into life, and assume a dictatorial tone, as if they were entitled to intermeddle with, and pronounce judgment in, an affair which has gone on prosperously without their aid, and is now in process of being brought to a conclusion, honourable alike to those who have cherished, and those who have conducted it, and of the proceedings and progress of which, their knowledge is of the smallest possible amount?

It has not been for want of opportunity that this indifference has been manifested. Major Rennel, Captain Horsburg, Dr. Wilkins, were all Fellows of the Royal Society. When were these gentlemen, individually or collectively, appealed to by the

learned Fellows, to use the influence which they possessed with the Court of Directors, regarding the Great Trigonometrical Survey, and other scientific undertakings in India?

Mr. Colebrooke and Mr. Edmonstone were also Fellows of the Royal Society, and were, I know, particularly the latter gentleman, most anxious to do all that lay in their power to promote science. The late Mr. Davis, and Mr. John Loch, gentlemen in the direction, and whose influence has always been considerable in Indian affairs, have not only shown no disinclination to exert that influence in the promotion of scientific pursuits, but have constantly been the advocates, the unflinching advocates of the Great Trigonometrical Survey of India. Of the latter gentleman I speak from personal knowledge, and with the warmth of personal friendship, and therefore mine may perhaps be considered a partial testimony; but it must be remembered that our friendship has been formed and grown up in the course of an official intercourse and discussion on this very question, and thereby only furnishes one more item of evidence of the accessibility of the members of that body towards those who will consent to study the happy mean between obsequiousness and superciliousness.

But of all those who have most shielded this extensive undertaking, and, at a time when the ink was yet flowing in the pen which was to pass its sentence of annihilation, have exerted themselves most to stay the hand of short-sighted economy, and perpetuate its existence till brought to an honourable conclusion, let me not omit to mention my lamented friend the late Major-General Salmond, the Military Secretary of the India House.

And what was the meed of praise which the learned gentlemen ever thought fit to bestow on exertions so honourable, and tending to make amends for the inglorious indifference displayed towards objects so purely national, by those on whom the burden chiefly devolved? Please your Royal Highness, the names of neither Mr. Loch, nor the late Major-General Salmond, are known within the walls where the Royal Society holds its

meetings; and this will be perhaps one of the first, if not the very first occasion in which either of them has been pronounced in connection with the subject of the Great Trigonometrical Survey of India.

I speak too, no doubt, of the late Military Secretary, with the warmth of personal friendship, but it was a friendship formed subsequent to my arrival in England in 1826, for prior to that we knew each other only by name. Mutual esteem grew up between us as our official intercourse made us better acquainted; and I hold it as one of the proudest events of my life that I made of this highly honourable-minded man a firm friend and powerful advocate, without being required to deviate from the course of candour and independence which had characterised me through life, and which had made for me few friends, and not that very few of enemies.

I have the honour to be, &c. &c.

GEORGE EVEREST.

LETTER IV.

" Cum scelus admittunt, superest constantia: quid fas
Atque nefas, tandem incipiunt sentire, peractis
Criminibus. Tamen ad mores natura recurrit
Damnatos, fixa et mutari nescia. Nam quis
Peccandi finem posuit sibi? Quando recepit
Ejectum semel attritâ de fronte ruborem?
Quisnam hominum est, quem tu contentum videris uno
Flagitio?" JUVENAL.

MAY IT PLEASE YOUR ROYAL HIGHNESS,

Of all the wonderful facts which history records, that of the government of India by Great Britain is the most calculated to excite surprise, and the most difficult to reconcile with any preconceived notion.

Whether we consider the relative areas of the two countries, or their respective amounts of population; the distance which separates the one from the other, or the total contrast between the manners, religion, usages, and climates of the two, where is the man who would have ventured to say *à priori*, that such a contingency was within the reach of probability, or even possibility?

The stranger who arrives from Europe to satisfy himself of the existence of this truly surprising feature in the history of man, is absorbed in wonder at the general security with which the traveller proceeds by night and day along the high roads, and is punctually conveyed from stage to stage in a palankin, carried

on the shoulders of relays of men, and lighted by torches carefully prepared, tended and carried by others, who chatter and wrangle with each other in a tongue unknown to him; whilst he, unless long intercourse, habit, and study, have made him familiar with the dialect of the inhabitants, is utterly powerless to communicate the most common emotion of his mind to a single creature around him, and is borne along, as if in a land of magic, at the mercy and will of his carriers.

The secret of all this is better and more concisely expressed in one of the dispatches of His Grace the Duke of Wellington, when the Honourable General Wellesley, than I have elsewhere seen, and consists in the fact, that the Hindus are the only true practical philosophers in respect to government. In fact, it seems a matter of perfect indifference to them who governs, provided they are allowed to hoard money by drops, and spend it by buckets-full in their own way; to follow the customs of their forefathers without interruption whether as regards religious worship, the rules of caste, or other such matters; to obtain hearing for their tales of hardship from those in authority over them; are not liable to be fleeced illegally, or more than they have been used to; and are ensured tolerable protection against plunder and robbery.

As to the Mohammedans, those who are nominally of that creed form scarcely more than one in ten of the whole population, and of those by far the greater portion are converted Hindus; converted in form of faith only, for they almost universally abide by their old habits, and continue to a greater or less degree to bow down before the same idols which were objects of the worship of their forefathers before the change.

The genuine Mohammedans are in fact the only class who exhibit any deviation from the condition of practical philosophy of which the noble Duke makes mention, unless indeed we except now and then some stray ambitious Brahmin or two, who may sigh for the pleasant times prior to the days of Mohammedan invasion, when their class was looked on as sacred and divine,

and had the privilege of plucking out tongues by the roots, and pouring boiling oil down the throats of low caste rogues who chanced to look awry at them, crossed their path in the morning, or presumed to pronounce any word of the Vedas or other holy books with their unhallowed voices.

Persons of this class would not be so easily contented to be governed by strangers and Christians; but then the mass of the people amongst whom they exist are bitterly hostile to them; and, outnumbered as they are by these, and powerless, as they know themselves, to make head against British discipline and British courage leading on and directing the multitude, they also deem it the part of wise men to put on the semblance of virtuous resignation to the decrees of fate, and the will of Allah or Parmeshwara.

I have taken the liberty, please your Royal Highness, to enter into this little preface, in order that I may be understood hereafter, without the necessity of a reference to first principles for this wonder of history. This unparalleled control of a vast and distant country, with all its complicated and intricate machinery, is, as we know, entrusted by the law of the land to the E. I. Company, who were in the origin, and still are nominally, a body of merchants trading to the East Indies, though they have for some years totally abandoned all trade whatever in their chartered capacity.

Now though individually the gentlemen of the Direction are, as I have above said, generally remarkable for their unassuming, unpretending manners, yet it is a great mistake to conclude therefrom, that they are insensible to the importance of their functions as a body: they have a perfect consciousness of their strength, consequence, and the mightiness of the trust reposed in them, in which respect they are perhaps hardly surpassed by the autocrat of all the Russias.

It must be evident to your Royal Highness, that a Government so constituted, whether we regard the home or local authorities which compose it, must have many objects to attend to which

are essential to the maintenance of their actual position and existence. The higher branches of science can only be promoted by them incidentally, as an interlude, if I may so express myself, not as a main part of the drama; and it ought to be rather matter of gratulation and praise, that they have accomplished so much, than that so much remains to be achieved.

And really, though I have no intention of sounding the trumpet of the Court of Directors, yet common justice requires me to say, that in matters connected with science, it would be difficult to find any set of men more actuated by purity of intention, singleness of purpose, or entire disinterestedness in the choice of their agents, than I have found them in all my transactions with them—and few persons have had more. Wherefore when they are told by an officer in their own service, in unmeasured terms, that "the public money has been usually muddled away in the accomplishment of scientific objects, one hardly knows how, in the most unsatisfactory way, with few or no results of any practical utility,"—I should think they have great reason to be not very well pleased with the compliment.

This elegantly-turned phrase is, I remark, attributed by Major Jervis to Professor H. H. Wilson and Dr. J. F. Royle, who were formerly also in the service of the E. I. Company; and it can hardly be doubted that these gentlemen are not very conscious of the obligation rendered by the Major, in thus coupling their names, in a published letter, with what he confessedly calls *a homely expression*, which were, as I humbly opine, much better consigned to oblivion; for as far as my experience goes, the E. I. Company have at least as much to show for their outlay in scientific matters as other governments usually have, and if this opinion be correct, the censure conveyed would be as unmerited as out of place. Now, though I am prepared to enter into particulars, and discuss the merits of this opinion of mine in proper time and place, yet as I am confined for room at present, I do not feel it incumbent on me to do so in this correspondence; and in the mean time I have only to hope, that those who controvert

it, will be prepared to define what they mean by the terms "*muddled away*," "*unsatisfactory way*," "*results of any practical utility*," which your Royal Highness will give me leave to say, are in India at least, if not throughout the world, of the most dubious import.

For example, the Great Trigonometrical Survey of India is perpetually denounced in the public papers of India as a source of waste and expenditure, both needless and profitless; and we have yet to learn whether this is the sort of *muddling away* implied by the learned gentlemen cited, for if it be, there is a difference *in limine* between them and me, and I presume your Royal Highness also, which had much better be disposed of before such a discussion were commenced on.

I will not be hard upon the learned Professor, whose amiable manners and good taste, as well as extensive acquirements, entitle him to a full allowance of the privilege of *desipere in loco;* and really, if all the hasty and unwise expressions which any of us poor mortals, however highly gifted, could be proved to have uttered during his lifetime, were to be treasured up, and brought in judgment against him, it would be a sorry affair.

The case, however, is very different, when an officer of the E. I. Company's Service, selected by the Court of Directors to hold the highest scientific situation under them, not only in a letter to his masters distinctly charges them with this misdirection of the funds of their constituents, but publishes that letter to the world, and that too in a pamphlet, with which is bound up an Address from thirty-eight learned Fellows, pledging themselves to make common cause with the author. This, I submit to your Royal Highness, is a decided breach of subordination and decorum, striking at the very root of that discipline without which no Government can hold together, but particularly one constituted like that of India. Our conquests in this country are owing to our superiority on this point, and without it they cannot be maintained; so that, if this, which is the basis of our rule, be undermined, the whole edifice must naturally tumble to the

ground, and with it will vanish all hope of further prosecuting scientific inquiries.

It is my persuasion (and few men have had better opportunities of forming a judgment, or have more solid ground whereon to entitle them to utter their sentiments with frankness than myself,) that nothing would, at all times, have afforded the Court of Directors higher gratification than the expressed testimony of the Royal Society to the value of their unremitted exertions in the cause of science, and the manifestation of a sincere and cordial desire on the part of that learned body to co-operate with them. I have little doubt that, as to the selection of a fitting person to be their Surveyor-General, the nature of the scientific operations most worthy to be carried on, or to the manner of conducting them, the Court would most thankfully receive any suggestions from the Royal Society which might be offered in the pure spirit of philosophy, and dictated by calm deliberation, and patient investigation; but a hasty Address, got up on the spur of the moment, calling on them, in language little short of peremptory, to repose confidence in, and delegate power to Major Jervis, a gentleman of whose practical fitness the thirty-eight learned Fellows who sign that Address knew nothing whatever, whilst the Court themselves have yet to find means to appreciate it, unless they are pleased to take that officer's own affirmations as valid warrantry, is indeed a very, very different affair.

In the meantime the Court, who are well known for caution in placing their confidence, will hardly have allowed it to escape them, with what ominous silence my name and experience are passed over, and set aside. Abundantly grateful I naturally feel, and most lowly do I bow to the ground for the implied compliment, and this unequalled return for all my labours and sacrifices; yet the Court, who have hitherto allowed to my poor merits a higher place in their estimation than they are entitled to, are, unfortunately for the project, as slow in withdrawing their confidence, as deliberately cautious in reposing it; and when they

come to reflect that I am myself a Fellow of the Royal Society, and have often sat within the walls of that assembly, where none ventured to question my capability for the trust confided to me, what is the result, please your Royal Highness, that they must inevitably come to ?

Is there any mode of escaping the conclusion that my absence is the cause ? that I am well known to be a person having an opinion of my own, which I will never yield but to conviction ? that the thirty-eight learned Fellows desire to have a more pliant instrument, and to impose on India and the E. I. Company, in the person of their Surveyor-General, a puppet, of which the strings of action shall be pulled by themselves ;—an automaton obedient to their impulse only, and who should move only by the mechanism which a quartetto of their nomination may be pleased to arrange ?

The plan is ingeniously enough devised, and if the learned gentlemen had known more of the local peculiarities of the country which is destined to be the theatre of their spectacle, it might have held out more promise of success ; but without some acquaintance with these, it can hardly avoid sharing the fate of poor Mr. Cocking's parachute, in which case the least evil to be dreaded is the fruitless waste of the public money, which will considerably add to the number of opponents of science in the abstract, already greater than is desirable, and, by bringing it into disrepute, greatly obstruct its advancement.

The crash which will assuredly ensue of the whole of the never-to-be rivalled scheme, is one which I could be well content to look on at with folded arms and resignation ; but I am anxious to rescue from the wreck what has been accomplished by myself, and preserve it from that sort of spoliation which has been so often carried on in times past and present, by scientific depredators, and will no doubt in times future, to the end of the chapter.

In such matters, men who pass for, and doubtless are, in the common affairs of life, strictly honourable characters, ofttimes

seem to labour under a species of mental hallucination, which blinds them totally, or almost so, to the distinction between *meum* and *tuum*. Who could have supposed that Halley, and the mightiest of the mighty, Newton, could ever have deliberately lent themselves to the cruel spoliation of Flamsteed, had their eyes been wide open to the wickedness of the deed? Yet it is too plain they did so; for what is it else than this, and what other name can possibly be assigned to the act of surreptitiously obtaining leave to examine a voluminous set of observavations, and then publishing them to the world, against the consent, and without the knowledge, of him who made them.

The disgraceful scene which appears in the end to have been enacted in the chamber of the Royal Society itself, in which the greatest philosophers of that or any other age,—one of them, probably, the most original genius that the world will ever see, and all grown grey in pursuit of science,—are described as lavishing personal abuse on each other, and dealing out mutual recriminations, in language which ought never to pass between gentlemen and Christians, still less philosophers, might well and ought to have been consigned to oblivion, but for the great moral lesson which it holds forth. If this lesson is to be lost sight of, it would have been the height of turpitude to rake up and revive from its ashes such an inglorious and indecent conflict; but if the object be to preserve us from the chance of a future infliction of the kind, we cannot too highly laud him who has taken the trouble to place the whole subject in array before a calm and unbiassed posterity.

Now it will hardly happen but that, having so long been engaged in the Great Trigonometrical Survey of India, there must be many portions of my work yet remaining to be brought up, which would have been all in a floating state if I had not been compelled by sickness to return to England in 1834-5; and even yet this might happen, if I were to quit India whilst any portion is left incomplete. What then is to deter some stranger hand from seizing on the data in my office, and giving them to the

world as his own? If the celebrated Halley could stoop to similar and worse meanness, and the immortal Newton could sanction such a proceeding with his advocacy, why are inferior men to be supposed more immaculate, and incapable of perpetrating a depredation of the sort I allude to?

Without meaning at all to attribute any disposition of the kind to any person in particular, yet as I have learned in my lifetime to be cautious of reposing confidence in men until long and effectual trial has convinced me of their worth, it must be admitted that till then I am perfectly justified in protecting myself from invasion; and therefore I look to the justice of your Royal Highness to stand by me, and give the support of your august name to the following arrangements, as the only reparation for the injury in which you have participated, as I suppose, unwittingly.

First: That no description of any thing whatever executed by myself, or my subordinates under my direction, be received from the pen of Major Jervis, or any other person than one of my assistants, Lieut. A. S. Waugh, Lieut. Renny, or Lieut. Jones, of the Bengal Engineers; for those gentlemen have been the companions of my labours, and are intimately acquainted with every part of them.

Second: That Major Jervis confine his description entirely to such matters as may have been executed by himself, and under his own superintendence.

Third: That if Major Jervis be (as I conceive he inevitably will) necessitated to avail himself of my arrangements, inventions and system, or of persons educated and trained by me, he be constrained to make a full, fair, candid, and unequivocal avowal of the extent to which he does so.

That your Royal Highness may perceive that it is not without reason that I express so much anxiety on this point, I beg to remark that I have in my possession a private letter from Major Jervis to my address, dated 9th January, 1838, which is indited in a style the total opposite of that of his pamphlet and letter

to the Court of Directors, dated August 6th, 1838. The former appears to have been written whilst that gentleman was in a different frame of mind from that which possessed him after the thirty-eight learned Fellows had bound themselves to make common cause with him; and the person in whose modes of thinking seven short months are sufficient to compass a revolution so striking and entire, is precisely the character with whom I least desire to have any thing in common.

I have the honour to be, &c. &c.

GEORGE EVEREST.

LETTER V.

"Whither bound? (you will ask) 'tis a question, my friend,
On which I long doubted; my doubt's at an end.
To Arabia the stony, Sabæa the gummy,
To the land where each man that you meet is a mummy,
To the mouths of the Nile, to the banks of Araxes,
To the Red, and the Yellow, the White and the Black Seas,
With telescopes, glasses, and a quadrant and sextant,
And the works of all authors whose writings are extant,
With surveys and plans, topographical maps,
Theodolites-watches, spring-guns and steel-traps,
Phials, crucibles, air-pumps, electric machinery,
And pencils for sketching the natives and scenery."

POETRY OF THE ANTIJACOBIN.

MAY IT PLEASE YOUR ROYAL HIGHNESS,

IN all matters connected with architecture or engineering, the master-hand of genius is more decidedly shown by converting such portions as are sound, and such materials as are serviceable, to the purposes of the fabric we are about to raise, than in pulling the whole edifice to pieces, and raising an entirely new structure of elements all our own.

The truth of this will be found in the daily operations of common life, wherefore I need not stop to prove it by an elaborate argument, for I do not doubt that I shall have your Royal Highness's sanction to treating it as an axiom; viewing it in which light I will proceed to apply it as a square or straight edge, whereby to test the various propositions contained in the Address of the learned Fellows to the Directors of the E. I. Company.

As far as regards myself, enough, perhaps more than enough, has been already said on so insignificant a subject; and as far as my masters are concerned, I have, perhaps, expressed my opinions at greater length than they will warrant or approve; therefore we will for the present suppose all obstacles removed, and that the Court have had the uncommon good-nature to be perfectly acquiescent in the whole proposition; that I am, either with or without my own consent, quietly out of office; and that Major Jervis, under the leading-strings of the self-elected quartetto, is fully installed, and at liberty to geologize, astronomize, geodetize, geographize, and natural-philosophize, in the wide extended plains, the sloping uplands, the precipitous hills, the dense forests, and the mighty mountains of this vast country, comprising, according to the map constructed by me in 1832-3, 10,765,907 British square miles.

The field is indeed, as the Address truly describes it, ample, and that to an extent adequate to the ambition of the most aspiring; but it must be remembered that the resources of the country are not unlimited; that quiet and practically philosophical as the inhabitants may be, they are not to be kept in order without some display of military force, or at least without the full consciousness that such a display can be called into action; that though they are contented with less, and have fewer wants, perhaps, than any other people on the habitable globe, yet they have a lively sense of right and wrong, of justice and injustice; and, though they do approach, in the opinion of some enthusiasts, to the primæval virtue of the golden age, still they are not so pure as that vice is utterly extinct amongst them—all which renders it not possible to dispense with tribunals and courts of law, magistrates, prisons,

collectors of taxes and imposts, not to speak of residents at the courts of foreign, or independent bordering states, in alliance with the E. I. Company.

Now though it may seem very unreasonable, yet soldiers will not serve without pay, even if the ammunition and other implements and equipments of their profession were to be had for no cost, which has not yet been brought to pass; collectors of taxes and imposts, judges, magistrates, residents and others, have a similar distaste for that condition; therefore a vast proportion of the revenues of the country is necessarily absorbed in these modes, and it is only the residual quantity after they are provided for, which can be considered disposable for scientific purposes.

Now, of this residue how to make the most, is a question on which it is my persuasion that the Court are, and long have been seriously bent; and it is not by peremptory calls on them, or high-sounding truisms of a mere general tendency, that their well-meant intentions will be promoted, so much as by calm investigation and deliberate calculation, drawn from an intimate knowledge of the peculiarities and bearings of the case.

Having admitted freely the amplitude of the field, I will, with the permission of your Royal Highness, consider the next point advanced, namely, the favourableness of the opportunity, which I regret to say cannot be so easily conceded; for of all periods that can possibly offer themselves, that in which it is incumbent on the British Government to show a bold front simultaneously on the north-western, northern and eastern frontiers, to meet or deter invasion, is, in my humble judgment, the very one which least comes under the denomination of favourable.

Your Royal Highness is doubtless aware, and can inform the learned Fellows, that at this instant a large British force is on its march to Kabul, Kandahar, and probably Hirat, to frustrate Russian intrigues and designs of conquest and invasion; that the bordering kingdom of Nipal is in a treacherous and doubtful state of alliance and amity; and that the chieftain of the extensive

empire of Birma has given so many symptoms, barely to be called equivocal, of enmity, as to leave little doubt that, sooner or later, he will force the E. I. Company into a war with him, thereby rendering a perpetual state of watchfulness and preparation an indispensable part of prudence and discretion.

Now, since a large force cannot be assembled, kept together, maintained in subordination and discipline, and led on against an enemy in a style worthy of Englishmen, without the presence of Officers, and since it is to military gentlemen that even the learned Fellows themselves seem to be aware that the execution of their projects is to be confided, therefore, when the presence of these agents is so absolutely required in other quarters, and for other duties, as to render their withdrawal necessary, I submit that it cannot be legitimately assumed either that *the opportunity is favourable*, or that *the Officers at the disposal of the Court are qualified to do justice to their munificent liberality*.

But if it were otherwise, still the main question of how best to direct and apply the definite portion of the residual revenue still remains to be grappled with; and, setting aside all flowers of rhetoric, ornamental phrases, common-places, and truisms, which (as it is reasonable to suppose the Court do not need to have such proved or inculcated to them) can only tend to complicate a subject in itself clear,—the propositions of the learned Fellows simply resolve themselves into the fact, that *it is desirable to cultivate those branches of sciences which relate to Physical Astronomy, Geology, Statistics, the improvement of the geography of India and the countries stretching between its frontiers and the Caspian Sea; to construct an improved map of India, and introduce into it an uniform system of orthography; to undertake experiments connected with the tides, with the magnetic dip, intensity, and variation, as also other experiments for comparing the standard of the Indian Survey with other known standards of Europe:* to the last of which Sir John Herschell's recommendation is appended in reiteration, for the sake, it may be presumed, of giving emphasis, confirmation,

illustration or conviction; as also two others from the learned Baronet, the one, *that an arc of longitude should be measured trigonometrically;* and the other, that *the zero points of the thermometers used in every part of the process under Major Jervis's direction* (that is to be?) *should be fixed with the utmost possible care;* as also one from Mr. Baily, that *the pendulum observations suggested by Col. Lambton, in his report of* 1822, *should be carried into effect;* the whole being wound up by the condition, added by way of supplement, which amounts in plain English to this: That Major Jervis, the mainspring, or rather the great fly-wheel that is to be, of this complicated system, is to place himself under the tuition of *Sir John Herschell, Francis Baily, Esq., the Rev. W. Whewell,* and *Professor Airy,* and do as they bid him.

Now, please your Royal Highness, this, though I have taken some pains to reduce it to its lowest terms, is still what in my department would be called *rather a strong order,* and coming before the Honourable Court of Directors, who are merely plain English gentlemen, endowed with a fair portion of the solid common sense which is so peculiarly characteristic of our country, with all its raciness and bloom upon it, it must, I conjecture, have astonished and mystified them not a little.

I am free to confess, in fact, that though I am myself but little prone to wonder at any thing that I see or hear, being a great admirer of the Preacher who teaches me that "there is nothing new under the sun," still I was somewhat startled at this long enumeration of duties to be attended to by one person, and that too in a climate where the thermometer stands ordinarily at 110 Fahrenheit in the shade, sometimes even as high as 125, and between 11 and midnight is often known to rise from 95 to 100; but then the idiosyncracy of some men is peculiar, and as we have the precedents, fabled or real, of the salamander and M. Chaubert to guide us, there would certainly be no wisdom in deciding *à priori* what any individual person might be equal to, though as a general question a little scepticism might be pardonable.

However, as I do not wish to take up the time of your Royal Highness with needless discussions and doubts, I am quite consentient to receive the fact of the Major's amazing prowess on the attestation of the learned Fellows, who have no doubt taken ample means to satisfy themselves on a point which seems to have been selected as the favourite basis of their address; for the supposition is not to be entertained for a moment, or if it were started, must be dismissed instantaneously, that gentlemen so learned would pledge themselves to aught that was crude, indigested, or doubtful, in a matter so grave and important.

Wherefore I will venture to consider, *seriatim*, the several points of the recommendation of the learned Fellows;—and to begin with that of Geology.

My knowledge of this branch of science is confessedly of so limited a nature, that I cannot pretend to rest any thing which I have to say regarding it on any other foundation than the plain rules of common sense;—and, first of all, let me in all deference offer the question, Is Geology in reality a branch of science which men cannot master out of Europe? If so, where is the reason for this peculiarity, which makes it so different from those of Chemistry, Astronomy, Mathematics, and other branches of physical science, which confessedly require more profound study than it does? These are all to be learned by books, and by patient attention men may become great proficients in them; of which so many instances will doubtless occur to the learned Fellows, that I need not mention a single one to obtain for the fact universal assent.

Geology and Comparative Anatomy are not sciences on which men have written sparingly; and, though it may be conceded that, as in all parallel cases, an access to the acquired stores of others who have dived into their recesses, and more particularly a familiar intercourse with learned gentlemen divested of arrogance, and actuated by a pure love of truth, cannot fail vastly to promote their attainment in him who is disposed to learn,—yet really I must beg to be pardoned for my ignorance and simplicity,

when I say, that the difference between the doctrines of those who deny the possibility of their acquisition without those accessories, and of the zealots who would put out of the pale all who do not believe exactly as they do, is, to my plain reasoning faculties, very slight and difficult to define.

Geology and Comparative Anatomy must, I conceive, by those who advocate the opinion in question, be sciences which rest on faith, and are not attainable by unassisted human reason; but those who cultivate them on such an hypothesis, must not shut their eyes to the analogy which their doctrine would present with all others based more on opinion than fact, which have, each in its turn, had their day and run their course, and each been swept off by the advance of knowledge, to make room for a successor.

The little which I have read, and I must own it is exceedingly small in amount, all tends, most unqualifiedly, to rescue this beautiful science from an imputation of a nature calculated, as I conceive, to vilify and degrade it to a level with all that is purely imaginary and dogmatical, in proportion to its uncertainty: wherefore, leaving to the enthusiastic but ill-judging advocates of a position of the kind, the task of defending it, I shall at once conclude that the slur is unfounded and unmerited, and that, in common with her amiable sisters, Geology is not doomed to wear the veil, and be addressed, and interpreted for, only by the priests of her temple; but may walk abroad into foreign climates, and go on her travels, just as they do, to all places where she is likely to meet with a hospitable and gracious reception.

Then, please your Royal Highness, if that this fair privilege is to be conceded to the lovely damsel, this Parbati, or daughter of the mountains, why is it to be assumed that she shall not visit her votaries in India? Is this alone of all lands to be condemned, to be deprived of her gracious presence, or receive her dictates only from such sources as the thirty-eight learned Fellows may decide as most fitting? Are the labours and acquirements of a Falconer, a Cautly, with many others, and though last, not least amongst them, of my own much-loved brother, the Reverend

R. Everest, to be treated as chaff, and passed over without notice, in a question bearing on the very subjects to which they have chiefly devoted themselves? And yet, of the three gentlemen whose names I mention, to two has been awarded the gold medal of the Royal Geological Society; and the third has followed all the forms prescribed by orthodoxy itself, that is to say, he studied Geology at Oxford, and was balloted for in due form, and admitted as a member of the same society.

These then are a portion of the elements which the Address of the learned Fellows goes to set aside as mere dross, to make room for Major Jervis; for to that the proposition clearly tends. If Geological pursuits are to be taken by the hand by the Government of India, from the very constitution of that Government it can only happen by means of an establishment united to a chief by the links and gradations of subordination. And do the thirty-eight learned Fellows really and in downright earnest suppose, that either of these, or other amateurs, whose names are well known and universally respected in this country, will consent to lend their aid and act in subordination to Major Jervis, of whom they know nothing but the name, coupled with the fact that he is undergoing a course of good advice and instruction from the learned quartetto of self-election renown?

If such be their opinion, I could assure your Royal Highness, if necessary, that it is at total variance with my experience; and though I shall not do so in the present instance, because I see how unavailing it would be to expect any weight to be attached to my experience, or that of any person, when it militates against a fancy, theory, or scheme of those who are in a wilful mood; yet, as the paroxysm may, it is to be hoped, eventually subside, and the film fall from the eyes of the proposers and hatchers of this sage project, their bantling will, no doubt, at last stand forth in all its native deformity, and display a scene somewhat akin to that which we owe to the imagination of our Bard of Avon:

"Oh Bottom, thou art changed! what do I see on thee?"

Of all branches of science Geology and Botany seem to be those which can be more safely entrusted to amateurs than any others. They may be more easily laid aside and resumed at pleasure: they demand less rigorous and undivided attention; the facts which relate to them call for fewer minutiæ to be registered and recorded; and provided there be not too great a scope given to the imagination, the learned can always be able to arrange and combine those collected facts with greater facility than they can those of any kindred branch; Astronomy, Geodesy, Chemistry, for example.

If then the question were merely to be, Whether, seeing the insufficiency of our resources to meet all demands, it be better to perform each part imperfectly; or leave those branches to shift for themselves, which are best able to do so, until the others, which without support are totally powerless, are effectually provided for,—there can, it may be presumed, be hardly the shadow of an argument for the former procedure?

But when our interference would actually tend to deprive the more self-sufficing branch of the fostering aid which it receives from the hands of amateurs, without supplying any adequate substitute, or one even equal in efficiency to that which it counteracts; is it the part of wisdom to dash headlong into such a scheme of innovation?

Yet even here nothing is said in the Address in reference to the past arrangements of the Honourable Court of Directors: no attempt is made to obtain information of what has been accomplished. The summons is brief, and almost peremptory, to do what, for all the learned gentlemen know to the contrary, the E. I. Company may have had done already.

Mr. Voysey, Mr. Laidlow, Mr. Turnbull Christie, have all been regularly employed in their times, by the Government of India, and received stipulated salaries, for the sole end of pursuing Geological enquiries. In 1817-18, a Geological Survey of the Himalayan mountains was instituted under the conduct of the late Capt. Herbert, and there are other instances of a like kind. Would it not have been more in keeping with sound discretion, to have

first made zealous enquiry as to the results of the labours of all these gentlemen, and pointed out, in the calm and dispassionate language of sound logic, where the deficiency consisted, and what were the best remedies to prevent its recurrence? But in truth it is so short and easy a process to condemn, and so much trouble is saved by shrinking from investigation, shutting our eyes to what has preceded, and making a peremptory and unlimited call for a totally new order, that but for the respectability of the source from which this call has sprung, it would hardly be reasonable to experience surprise at its occurrence.

I too, though as a Geologist my pretensions are confessedly nothing, and my other avocations have left me little leisure, have not been altogether wanting as an humble instrument to advance its interests. In the operations of the Great Trigonometrical Survey, it is an invariable rule with all my subordinates to collect specimens at my different stations, and give descriptions of the formations of the countries we pass through; a duty in which my admirable assistant, Lieut. A. S. Waugh, of the Bengal Engineers, stands preeminent amongst us. Of these, the details are destined to appear when my next work is printed; and therefore it would be unfair to enumerate, amongst the other subjects of reproach, that these have been passed over without notice, except in so far as the very fact of a summons of the kind pervading the Address, coming forth whilst the work to which it relates is still in progress, argues want of that patience which men chiefly expect from the votaries of science.

But the same consideration cannot be adduced in palliation in regard to another case, which I proceed to narrate.

In 1832, Lieutenants Waugh and Renny, of the Bengal Engineers, were appointed, on my application, to be my assistants on the Great Trigonometrical Survey; and as I had an opportunity of employing them on a roving commission, without interfering with the more important duties peculiar to their new profession, I obtained the sanction of Government to send them to explore the vast tract marked Terra Incognita in the map of India, lying between Rotas Garh, Omar Kantak, and Ihabalpur.

In the instructions which I drew out for these gentlemen, Geology formed no inconsiderable feature; their survey was completed in 1833; and in 1834, the maps, field-books, and several beautifully-executed Geological and other drawings, were sent to my office, and thence transmitted to the India House, where I know they arrived in safety and good order, and were greatly admired.

Now, please your Royal Highness, two gentlemen more highly distinguished by all the qualities which adorn the soldier, the gentleman, and the man of science, are not, I persuade myself, to be met with in any part of the world, than the two whose names I have above cited; yet their labours have passed unheeded, unnoticed, and unknown; their names, it may be concluded, have never been pronounced within the walls where the Royal Society assemble; and in an Address signed by thirty-eight learned Fellows, with the signature of your Royal Highness at their head, they stand tacitly condemned, as part of the rubbish to be eliminated, to make a clearance for the representative of achievements that are to be. Yet both Lieut. A. S. Waugh and Lieut. T. Renny are brother masons, and belong to the same fraternity with your Royal Highness and my humble self. They are natives of Scotland too; and if the national sympathies of that country be not falsely assigned, we may expect that, in the fulness of time, they will not want friends to back and protect them against wrong; though I, as an Englishman, may look in vain for other backing than that which Sir John Falstaff so feelingly deprecates.

I have the honour to be, &c. &c.

George Everest.

LETTER VI.

" So when your speculations tend
Above their just and lawful end,
Although they promise strange and great
Discoveries of things far set,
They are but idle dreams and fancies,
And savour strongly of the Ganzas."

HUDIBRAS, PART II. CANTO III.

MAY IT PLEASE YOUR ROYAL HIGHNESS,

WHAT has been advanced in my last letter on the subject of Geology, will, as it seems to me, apply with very little alteration to the next point in order in the Address, *Statistics;* which also, for the reasons shown, cannot be taken up by the Government of India as a separate consideration, without infringing on the disposable residue of the resources of the revenue.

Statistics, however, may certainly be attended to, in conjunction with topographical surveys; and, when I learn that the learned Fellows have taken such measures as are conceived necessary in ordinary life to ascertain the fact of this subject having been overlooked or neglected, and that their summons to the Honourable Court of Directors is founded on this circumstance, with the existence of which they have taken due pains to acquaint themselves, it will be time enough to enter into an explanation, and either acquiesce in or refute their censure; failing the latter of which, I shall be consentient to unite my humble voice to theirs, whenever they may be raised in a tone free from dictatorial clamour, and in such wise as it may be befitting the Court to receive, or me to offer.

Though it is not the business of the Great Trigonometrical Survey, which is peculiarly that of triangulation, to attend to Statistics, yet, perhaps, the learned Fellows may discover upon maturer search, (if indeed that may be put into the comparative degree which has none to compare withal,) that there are in the India House diverse statistical details (more particularly in former years) from the Madras side of India, but also in latter days from the Revenue Survey Department of Bengal, not so totally undeserving of the notice of learned gentlemen who desire information.

That these ought to be published, will be another consideration after their existence has been ascertained; but previous to this step, gentlemen who have had to deal with printers and publishers need not surely be informed by me, that a considerable arrangement of the materials might perchance be necessary; and as the Court have of late years been deprived by death of no less than four of those best able to assist and advise them in such a task,—Rennell, Horsburg, Wilkins, Salmond,—there might, perhaps, be now a little more difficulty than would have been experienced, if at any time during the last forty years such a proposition had been made.

I throw this out merely as a suggestion, for it is my entire persuasion that, so far from having any reluctance to publish such data, the Court would be very thankful to any person who would gratuitously undertake the arrangement of such documents for publication, from the pure impulse of that disinterested public spirit which, there can be no doubt, is the ruling motive of the learned Fellows; and it stands to reason, that a body of English gentlemen, so conscious as that Court must feel, of their fair claim on the respect of their scientific countrymen, and so sensible as they cannot but be to the neglect which their exertions and sacrifices have been met with, would rather prefer to let the result of operations so confessedly honourable to their character see the light, than moulder away by atoms on the obscure shelves of their offices.

I am speaking, please your Royal Highness, from conjecture, not authorisedly at all: the fact may be otherwise for aught that I can vouch; but has the experiment been made, and failed? If not, my hypothesis is at least as good as any other that can be advanced.

To proceed in the order which is most convenient to me, and I presume not objectionable to your Royal Highness: the next part of the Address points out to the Honourable Court the propriety of undertaking experiments connected with the tides, the magnetic dip and intensity; to which I can perceive no other general objection than what I have so often urged, namely, the utter impossibility of depending on amateurs for doing aught but what suits their own pleasure; the total elimination of the exertions of that class, which would follow the interference of Government; and the impossibility of making such experiments a state affair, without incurring a large expense; which the local Government might, perhaps, think would be better applied to other purposes of more urgent need.

In questions of this sort, however, even the small range of imagination and theory which might be pardoned in the instances of Geology, Botany, and Statistics, cannot, in my humble judgment, be allowed; nothing short of the extreme uncompromising rigour of registry and observation, which is the fundamental principle of the Great Trigonometrical Survey of India, can in my humble opinion be tolerated for an instant; and he who in the smallest item has ever been implicated in, or can be reasonably suspected of interpolating, unless he should make a full and unqualified confession of his offence, and give satisfactory assurance that he will sin in likewise no more, can never be admitted to participate in such experiments.

That practice which many persons have, even without bad intentions, of jumping at a conclusion which they think they see most clearly—the moral-certainty men, for example—do, in my humble opinion, more mischief in perpetuating error, than years of painful toil can compensate; for where are we to put the

limit, and how decree the relative values of two sets of conflicting data, unless the particulars of each are circumstantially and faithfully recorded? And by how much more is the difficulty of the task imposed on unflinching accuracy enhanced by the reflection that, let the pains taken be what they may, their results can only enter into a competition with others, obtained in a style which never ought to have been relied on, and which none but either the bold impostor or the well-meaning but illogical enthusiast, would have resorted to.

On this account, if my voice have any weight with the Honourable Court of Directors, I shall most strenuously recommend them to adopt especial measures to close the entrance to any superficial data. My opinion has always been, and I have made no scruple of offering it when I could do so consistently with the respect I owe to them, that experiments calculated to advance any branch of science are worthy of their patronage; but at the same time, it is a sentiment which I have always avowed, that experiments either incautiously made or negligently recorded, are far worse than no experiments at all.

The question, then, becomes an exceedingly simple one, and resolves itself into this: Whether, seeing that the rigour of attention and trustworthiness which alone make results worth seeking cannot be obtained without a considerable outlay, it be advisable to incur that outlay, or dispose of the cash balance in one of the many ways more immediately advantageous to the great population which Providence has decreed they shall rule? This, I submit to your Royal Highness, is a matter which those can best decide who know most of the facts of the case; and though it is my persuasion that the Court would most thankfully receive any suggestions on this or any other subject from able men who were acquainted with its merits; yet, when thirty-eight learned Fellows of the Royal Society stalk into the arena, and, without knowing or caring for details and particulars, proceed in all the pomp and pride of learning to lay down the law—your Royal Highness must forgive me for saying so—but

it forcibly calls to my mind the story of the man who proposed to do all sorts of impossibilities *somehow by a spring*.

I will, with your Royal Highness's permission, next pass on to the subject of Pendulum experiments, in reference to which I have to observe that Col. Lambton's authority is not to be quoted in advocacy of invariable pendulums uncompensated.

That able and admirable philosopher was very clear-sighted and discerning; and as to my certain knowledge no pendulum of that class had ever reached him, he is in nowise responsible for any application which learned gentlemen may think proper to give to his writings in connexion with it.

It had long been a favourite scheme, which Col. Lambton entertained to the last, to use his astronomical clock, (a very valuable time-piece by Earnshaw, now the property of the Honourable E. I. Company, which had a compensated gridiron pendulum,) at all the stations of the Great Arc, retaining its length invariable, and determining the increments of gravity by those of time.

When Capt. Kater's experiments with the reciprocal pendulum first became known to him, his admiration of the principle and ingenuity of the inventor were expressed in unmeasured terms; and he certainly then had thoughts of combining this new and attractive implement with his former scheme, with the intention of determining the absolute length of the seconds pendulum; but though he was sufficiently communicative, I cannot call to mind that he ever proposed to abandon his compensated pendulum for one uncompensated, and which had the manifest disadvantage of combining errors of its own generation with those of the clock to which it was referred.

Col. Lambton had, moreover, not seen the paper which the Astronomical Society did me the honour to publish in their Transactions, on this subject, in 1829-30, for he was then lying peaceably in his grave, and I was in the origin, and at the time of his death in 1823, one of those who had, as heedlessly as others, been drawn into the vortex of general admiration of the bright

conception of one whom we claimed as belonging to our Great Trigonometrical Survey, and whose fame we cherished with kindred pride and affection.

Therefore I submit to your Royal Highness that it is not correct to cite Col. Lambton in support of what is at all dubious; and that the invariable pendulum is liable to this objection, I proceed to show.

In the first place it is, I contend, impossible to ascertain the correct temperature of a bar of metal by suspending thermometers contiguous to it in the air; nor is it practicable to do so even when, as in the case of our standard bars, cavities are hollowed out to receive the bulbs. This was effectually decided by Capt. Wilcox, Mr. James Prinsep, and myself, in 1832, at the Government Mint, at Calcutta, in a series of experiments, wherein a current of steam was made to pass longitudinally along the bar, which was for that purpose enclosed in a double cylindrical case of white iron; for immediately after the vapour had filled the case, the thermometers, lodged in the cavities before mentioned, rose to the boiling point, whilst contact with the bar itself was still, and, for some time after, endurable without pain by the hand.

Eventually it was found that the only possible method of obtaining experiments worth the trouble of making or recording, was to fill up the cavities with the bulbs in them to the orifice with fluid mercury, which, with a little expense of time, brought the desired end to pass; and ever since that period all comparisons of iron standards have been invariably made in my department with the same precaution,—a practice which I should have extended to brass scales also, but for the impossibility of using fluid mercury in contact with that metal, without injury to both.

Now, the same cause which acts as a barrier to the introduction of this indispensable precaution in the case of the brass scales of my department, must operate in the instance of all the invariable or reciprocal pendulums which I have ever seen; and as the impossibility of ascertaining the correct temperature, when

it is neglected, has been proved by trial, and is matter of notoriety in India, therefore it is logical to conclude, that the true increment of the bar from the variations of temperature never has in any one instance been known or can be determined, unless indeed the construction of the apparatus be vastly improved over that which was in prevalent use in 1830.

Of the very few persons whose acquaintance I courted when I was last in England, Sir James Ivory was one. That celebrated philosopher was a Professor at the Royal Military College at Marlow at the time of my entering that institution as a Cadet; and independent of all other considerations this would of itself have sufficed to draw me closer to him; but when I recollected that in the theoretical part of the very profession to the practice of which I had devoted the best years of my life, he was a leading writer, if not looked up to universally as the very leader of our flock—the chief priest and expounder of our oracles, I felt it indeed a very proud honour to be allowed to plead this former acquaintance as an excuse for intruding on his retirement.

That Sir James has forgotten me is but too clear—the absent are proverbially liable to such wrongs—but that a name for which I have ever felt, and shall never cease to feel, the most unfeigned reverence, should appear amongst the thirty-eight Fellows :

" This was the most unkindest cut of all."

This, however, is straying from my subject, which was not my intention, but the object of the digression is to introduce other matters bearing on the question of the pendulum; for together with the failure of all remembrance of my unimportant self, it may not be groundless to apprehend that the recollection of all conversation with me may have vanished from the memory of my estimable friend.

I am, however, of those who, whether it be for their good or evil fortune, do not so easily relinquish impressions of incidents of any kind, and am particularly retentive of such as are cal-

culated to flatter my self-love; wherefore I may be taken as evidence in stating some parts of the conversation at such occasional interviews as bear upon the subject, because the opinions of that celebrated mathematician first called my attention to certain facts which I have since habitually kept in view.

I well remember then, please your Royal Highness, that at one of those interviews Sir James Ivory first taught me to expect that though a pendulum may be compensated so as to show time most equably for twenty-four hours, yet it does not follow that this perfect compensation will be preserved through the intermediate portions of that diurnal revolution.

Now, though I dare say that this is a fact which many learned gentlemen may have often heard of before, yet, making such allowance as I am entitled to claim from the peculiar mode of life which I have led from my youth upwards, unprejudiced men will not deem it matter of marvel that it should have been new to me some ten years ago; and as I have stored it up in my mind, so now I have other facts which tend greatly to corroborate the hypothesis, if not as I conceive fully to confirm it in all instances, of what is called the gridiron compensation.

The compensation-measuring bars which Col. Colby invented for the Great Trigonometrical Survey of Ireland, are, as your Royal Highness is doubtless aware, arranged on the same principle as the gridiron pendulum, that is to say, a nodal point is fixed on a tongue projecting at each extremity by means of the relative increments of brass and iron; wherefore admitting that like causes produce like effects, we may expect that if the idea suggested by Sir James be applicable to the latter, the result which it involves will also be apparent in the former.

Hence then is derived a very easy and certain mode of testing the truth of the hypothesis; for those bars are habitually compared by a numerous course of successive trials with a ten feet iron standard, both before and after employment in a measurement; and the results, nearly three thousand in number, all tend

to corroborate the notion that it happens in practice precisely as my philosophic friend had predicted.

The admirable course of patient trial and investigation which that accomplished gentleman, Capt. Drummond, of the Royal Engineers, made at the Tower in 1827-8, under the orders of Col. Colby, may or may not lead to the same conclusion; for though I was present at part of these and examined their recorded peculiarities, I cannot remember that I bestowed the pains they merited to search for the existence of this principle amongst them. The cause of my omitting to do so may perchance have been, that I participated in the infectious oscitancy of Somerset House, or that I had too many other things to occupy my time; but whatever might have been the reason, it would have made me very careful to withhold my signature from an Address in which such a question could have been involved in its remotest bearing.

But, have the thirty-eight learned Fellows examined the details of that course of experiments with the caution they deserve? And do they go to support or disprove the opinion that I have above advanced? It is in vain to urge distaste for such an investigation. If the inclination for the *dolce far niente* and a quiet life be so absolute and irresistible, let it be said so, and no person can have a right to require or expect what he would not take the trouble of doing himself; but then I submit to your Royal Highness that the tone of dictature must be abandoned by those who shelter themselves under such a pretext; for to retain both privileges of ease and authority is contrary to the trite and homely proverb, of the cake which cannot be kept and eaten too.

As to the facts which I have myself brought together on this subject, I am quite aware that the *primâ facie* objection against the conclusion above advanced will be, that the bars were not in the origin properly compensated by Mr. Simms, and I am prepared to admit the truth of this to a limited extent; for, taking a long series of observations, the result certainly points to a small

increment from temperature, to the extent of $\frac{1}{17}$ to $\frac{1}{18}$ of that of hammered iron, thus showing that the compound bar is what we term somewhat undercompensated, but this law certainly does not prevail between individual observations; and so far from there being any *primâ facie* traces of its existence, there is as often a semblance of a decrement as of an increment of length, consequent on an increase of temperature.

But to what purpose do I enter into this lengthy detail? For the information of learned gentlemen who will perhaps find it necessary to ask what measuring bars I am alluding to;—gentlemen who sit quietly in their easy chairs, before their comfortable firesides in the winter, or may gaze at will on the verdant lovely meadows, golden corn fields, and majestic ocean which surrounds the shores of adorable England, not to speak of the interminable delights of civilized life which are perpetually open to them:—what can it signify to them, or why are they to take the trouble to ascertain what goes on in India?

I freely admit this plea, and if I had been left to proceed with my work in peace, and unmolested to the end, I should never have intruded myself on your Royal Highness, but reserved such discussions as this for the period when, my labours being completed, I could have given them in a body to the public, neither courting notoriety nor shrinking from criticism, or in other words,

> "For my own part, I could be well content
> To entertain the lag end of my life
> With quiet hours; for I do protest
> I have not sought the day of this dislike."

This premature discussion has therefore manifestly been forced on me, by the intrusion of the thirty-eight learned Fellows into my quarters; and as they have all the learning and all the leisure as well as numbers on their side, against one poor soldier, the privilege cannot be denied to me of being prepared to parry blows which the abundant generosity displayed by my adversaries shows me they are fully equal to aim behind my back, or at any part which I may leave exposed.

I placed at the disposal of all gentlemen who desired to inform themselves respecting the magnificent instruments ordered by the Court of Directors, the amplest opportunity of doing so in 1830. For upwards of twenty days the apparatus of which I speak was open for actual inspection in its working order, in the suburbs of London, at a cost of no less than £130 to the Honourable Court of Directors; and let the learned gentlemen who have signed the Address ask themselves how many of them condescended to avail themselves of that occasion?

Now whether Capt. Drummond's course of experiments exhibits traces of partial discrepancy and total regularity analogous to mine, I cannot say; and as I have not heard that any other person has decided in the negative, I shall for the present consider them as neutral testimony on the point, which it will be manifest to your Royal Highness that I could not do in silence, consistently with a due regard to the priority in this respect of the General Trigonometrical Survey of Ireland, and with the high esteem which I personally entertain for the urbanity and cordiality which I have universally met with from all the members of that establishment.

If then this reasoning be admitted, there will evidently be a new source of error arising from a reference of the pendulum of experiment to a clock, whose real rate at the instant of comparison differs from that which is assumed as derived from observations of transits; and it is useless for learned gentlemen to get angry or dogmatical, and unite in a body to condemn such a notion, because I, who am absent, and wandering in savage wildernesses, presume to advocate it; for your Royal Highness will see that it was once entertained by Sir James Ivory himself, and that to his teaching I am originally indebted for it.

Amongst those of my countrymen with whom I became acquainted when I was last in England, I will take the liberty to mention Mr. Dent, who is now in partnership with Mr. Arnold of Fleet-street, and was then rapidly rising into eminence as a maker of chronometers. To Mr. Dent I have often communicated my sentiments on the imperfection of the go-between pendulum,

which I can never look on but as trenching on the legitimate rights of the clock pendulum, which needs no such interloping appendage.

My opinion has always been that which Col. Lambton entertained as the basis of his projected experiments, namely, to use the clock pendulum itself without any array of tail pieces, and disks, and immersions, and emersions, and telescopes; all which, though no doubt they display great ingenuity and contrivance, yet to my unsophisticated judgment seem only calculated to complicate a very simple subject which it is advisable to reduce to its lowest terms.

It was Mr. Dent's opinion that a clock constructed on that suspension would not perform well; and though I should not, as a general practice, cite the bare opinion of any person in proof of any thing but its being his opinion, yet, where the giver is a person eminently successful in the practice of the particular business to which it relates, it furnishes a strong *primâ facie* argument in favour of its correctness.

Let us examine, please your Royal Highness, how far Mr. Dent may be right in this conception, and how far he is borne out by other facts. There is an impression on my mind that I have somewhere read that a celebrated German philosopher actually ascertained by examination with a microscope of sufficient power, that at that point of the arc of vibration where the resolved part of the rotatory force in the direction parallel to the horizon was greatest, the knife-edge actually slided along the agate plate; and the further impression is, that I have conversed with Mr. Francis Baily on that subject: but it is so long since I have given any close attention to questions of this nature that I cannot speak very decidedly as to the fact, which luckily is the less necessary in the present instance because Mr. Baily is not of the absent, and can correct me, if I am wrong in citing him.

My impressions, it may be said, go for nothing, and the introduction of them in a discussion of this nature is not consistent with sound logic; all which would be indisputable, but for the

consideration that the Court of Directors have pronounced their fiat, that as long as I stay in India they will look to me as their only responsible adviser; wherefore, as the advice which I shall consider it my duty to give to my masters, in return for their confidence, will be made up altogether of my impressions, it is manifestly desirable that I should be converted, before the string of reforms and innovations projected by the thirty-eight learned Fellows can proceed, and this is luckily more easy in the present instance than it seems; for, though certainly the declaration might come more gracefully from any other quarter, yet I beg your Royal Highness will do me the justice to believe that there is hardly a person existing more open to conviction, or more amenable to the laws of demonstration and sound clear reason, than my humble self.

What has been above offered respecting the invariable pendulum, will equally apply to the reciprocal pendulum; but in the latter there are manifestly other points also to be attended to. Now it is shown in the paper to which I took the liberty to advert some time back, which has never been confuted, because as I believe it is not to be impugned, and which, though now to all seeming thrown aside and neglected as trash and rubbish, originally met with a cordial reception from the Astronomical Society, and cannot therefore be so utterly undeserving of notice as the silence of the thirty-eight learned Fellows would leave us to believe; in that paper it is shown that there is an imaginary line joining the centres of suspension and gravity, in which the centre of oscillation will also be found, which has hitherto been practically intangible; and that if the knife-edge be inclined to this line, an error sufficiently sensible in amount to vitiate all the experiments for absolute length will infallibly be incurred. Now supposing the knife-edge to have been originally set by the square, quite perpendicular to the face of the bar, that does not argue that it is also perpendicular to the physical line; and even supposing that it were, in spite of the infinity of chances to one, to have been so nicely set by the maker, who shall decide that it

will remain so, amidst the perpetual variations arising from changes of temperature and other causes?

My friend the late Mr. Edward Troughton, I know, immediately after the publication of my paper devised a pendulum of a cylindrical form, with two circular collars united to it, and suspended by two supports of the knife-edge form, the cylinder itself being constructed of three tubes drawn one within the other, all which was very well no doubt, and, as I conceive, might perhaps have furnished the means of determining two lines, which would give the length of the pendulum at their points of intersection with the physical line above alluded to. That pendulum was in progress when I left England, and I did not stay to witness its completion; but I never thoroughly understood the details of how the distance between the two lines in question, which are obviously nodal lines, each defined by the intersection of the surface of its collar with the plane perpendicular to the physical line, or true axis of the vibrating body, was to be subjected to measurement by means of micrometers.

I have great reliance in the sound judgment and inventive resources of Mr. Troughton, and therefore conclude it to be likely that he had duly provided for all this; but as I did not convince myself by actual trial and inspection of the fact, and, except in points of revealed religion, never put implicit faith in any man's infallibility, therefore there is another unfortunate prepossession of mine standing in the way, which will be likely to tint with its unhallowed hue all the advice which I may have occasion to offer to my masters.

Your Royal Highness will see therefore that it is not the Court of Directors of the E. I. Company, but I who am to blame, for the omission of pendulum experiments, for the implements are actually at my disposal as far as material is concerned; that is to say, two invariable pendulums and two clocks constructed by no less celebrated an artist than Mr. Jones, of Charing Cross, perfect, I believe, in all parts of their apparatus, and exactly like

those used by Captain Sabine, are at my command, and have been since 1830, and all that since that time has been wanted is the *personel* to put them into action.

Here is a frank avowal at least, and when the Court are called on peremptorily to take in hand a work for which they naturally conceive that they have already made all the provision which rests with them, it becomes me to step forward and make the controversy my own.

Much and anxiously as I desire to see the day when experiments free from slur or objection can be made with the pendulum, yet it will be obvious to your Royal Highness, that, holding the opinions which I do, I could not, without abusing the trust confided to me by my masters, recommend to the local Government of India to make them an object of paramount importance, whilst other matters of more consequence were likely to be compromised by my so doing; and this would be the impulse by which I should be actuated in the present case, even if I were thoroughly persuaded that the practical method of making those experiments were sufficiently accurate to warrant the outlay. *Materiel* consumes no corn, and may repose in quiet till it is wanted; *personel* must be maintained at a monthly cost, and can only be provided for by abstracting from some other source; but I have already in my capacity as Surveyor-General of India, acquired for myself the agreeable character of subjecting the Government of this country to the necessity of violating the rigid rules of economy which the state of their resources has rendered imperative on all branches of their service, and this, though I have never required any grant but what was absolutely indispensable to the respectable existence of the Great Trigonometrical Survey.

By the term respectable, I mean to imply the establishment of a system whereby may be ensured not only the able execution of the work, but its untampered-with and unimpugnable registry and divulgement; for rather than allow any deviation from these

maxims, rather than sanction by my voice the practices which Mr. Babbage so ably exposes, and subject aught under my superintendence to such mortifying stigmata, I would at any time of my career have resigned all further connexion with my honourable situation, and certainly should now be least of all prepared to abide by it.

Better is it to do one thing effectually than many things imperfectly. Pendulum experiments cannot be superintended by me, because I have too many calls on my time. The person who is to execute them must learn his business, and learn it well too, or I will have nothing to do with the matter; yet the task of instruction and surveillance too must be mine. Where are persons to be found on whom I, who have been taught by experience to be chary of relying on mankind in general, can repose confidence to do as I would do if I were myself present? Such persons there are: the gentlemen whose names I have mentioned once already to your Royal Highness as our brother masons are entitled to and possess my full and unbounded confidence, both in their candour, their high and honourable feelings, their subordination, and their discretion; but such persons are rare indeed: —the few that I have been able to meet with are wanted for the Great Trigonometrical Survey; they have other duties of a harassing nature, such as the thirty-eight learned Fellows can hardly form a conception of, to perform, which they execute satisfactorily; and I would not for the world distract them from pursuits where they are so eminently useful, by imposing on them the additional duty of watching the vibrations of an interloper pendulum, which I know by experience that they have not leisure to attend to.

On my head then rests the blame, if blame there be. The two pendulums will remain in quiet repose and preservation, until the time arrives when I can, in my opinion, honourably retire, and leave my successor to occupy my vacant seat. Major Jervis may then have the full and undivided merit of completing

his course of experiments; and I only hope, as a sincere friend to science, that he will attend to the principle which has been the prevailing characteristic of my pilotage, to do nothing in matters connected with the exact sciences imperfectly, or in such wise as to derogate from the spotless fame of the Great Trigonometrical Survey of India.

I have the honour to be, &c. &c.

GEORGE EVEREST.

LETTER VII.

"Heureux au moins les gens de lettres, s'ils reconnoissoient *enfin que le moyen le plus sûr de se faire respecter, est de vivre unis,* s'il leur est possible, *et presque renfermés entre eux; que par cette union ils parviendront sans peine à donner la loi au reste de la nation sur les matières de gout et de philosophie; que la veritable estime est celle qui est distribuée par des hommes* dignes d'etre estimés eux mêmes, *que la charlatanerie enfin est une farce qui dégrade le spectateur et l'acteur; et que la soif de la reputation et des richeses est est une des causes qui contribueront le plus parmi nous à la décadence des lettres.*" D'ALEMBERT ESSAI SUR LES GENS DE LETTRES.

MAY IT PLEASE YOUR ROYAL HIGHNESS,

IT is remarkable that in the long list of desiderata enumerated in the Address of the thirty-eight learned Fellows, all mention should have been omitted of both Meteorology and Botany; and though I do not mention this omission as a reproach, because in truth the list is not deficient in length, yet it serves to confirm the impression which is conveyed by the general tenor of the Address, that the learned Fellows either concluded those branches of science to be worthless, or that they were effectually provided for already.

I should certainly be sorry to be obliged to adopt the former solution, for it would argue that the skilful application of the actual cautery by Mr. Daniel, in his valuable Meteorological Essays, had already been cicatrized and forgotten; and I shall therefore, as the choice seems open to me, conclude that the latter consideration was uppermost, in which case, as the points touched on in the Address are chiefly those entrusted by the Court of Directors to my management, I certainly feel the full weight of the compliment implied.

Just in the same way that whenever it was practicable without compromising my more important duties and professional objects I have lent a helping hand to Geological pursuits, so likewise Meteorology has been the subject of my care; and pursuing the train of reasoning for which I am mainly indebted to Mr. Daniel's suggestion, I have invented and constructed an instrument called a barometer pump, whereby barometer tubes may be filled without the slightest apprehension of breakage.

This instrument is no longer the subject of mere theory, for it has been practically applied with great success to filling several tubes belonging to my department into which the air had obtained admittance, in presence of Dr. Falconer, Lieutenant Waugh, and myself, besides several other scientific gentlemen of my department and acquaintance: in fact, it is a handy and simple apparatus which any body can use, under any circumstances, who will consent to give sufficient attention to the packing and valves, and has two hours' leisure. I had intended, when my time allowed, to construct a duplicate of this apparatus for the acceptance of the Royal Astronomical Society, or at all events to communicate such a description as would render it a subject of familiar acquaintance in the work which I have of late been, and shall still for some months be occupied in preparing; but my volunteering this explanation in this place, where the total absence of a dictatorial summons is so manifest, will, I hope, be attributed to its right cause,—an earnest desire to afford all the little information I may possess, whenever I can do so without compromising what I conceive to be my due.

In the same manner that I am indebted to Mr. Daniel for the original suggestion of filling tubes in vacuo, I must own my obligation to Dr. Falconer for having first shown me the practicability of dispensing with the close cistern in the mountain barometer; and thus I have been enabled to approach very nearly to the solution of the difficulty which that most original and able of modern inventive geniuses, my friend Mr. Babbage, once expressed in my hearing, namely, to construct a barometer such, that it may be conveyed with a traveller in a carriage, put up instantly on the stopping of the vehicle, observed, registered, dismantled and repacked whilst the horses are being changed.

But why do I mention Dr. Falconer and Lieutenant Waugh and other scientific gentlemen, though one of them should bear the classic and endeared name of Edgeworth? The scene was in India, in the Himalaya mountains, at the Great Trigonometrical Survey station of Hatipaon! What can the thirty-eight learned Fellows expect of such a place, with such an outlandish name too, enacted moreover by persons who are either absent or whom nobody knows and none of the dominant coterie ever heard of!

As in the fulness of time perhaps more will be said on this interesting subject, I will, with your Royal Highness's leave, pass on to the next theme which I purpose selecting for discussion, namely, that of a uniform system of Orthography; in relation whereto, I must premise that this is a question in which, as parties run high in India, it is easier to offer a peremptory call of accomplishment, than to show the mode of adjustment by bringing men's minds to agree as to what is best.

The thirty-eight learned Fellows apparently imagine, if indeed they ever gave the subject a thought, that all the natives of India either speak or write English, or at least use the English written character and type;—but when the actual amount of knowledge of the advocates of a scheme is so indeterminate, it is difficult to know where to begin; and therefore, to the better understanding of first principles, I will proceed to communicate the facts of my own experience, on which I intend to reason.

India is about thirteen times as large in respect to area as Great Britain and Ireland combined, and the English written character is in no more use than the Hebrew character is in England. The inhabitants of India do not speak a common language, but several languages, which do not seem, from the accounts given of them by grammarians, to have even a common origin: thus, the Shanscrit is the basis of the Hindi, or Nagri, which is the prevalent language of the rustic population on the banks of the Ganges; but it does not seem to be the basis of the Telinga or Telugu, and other languages to the south of the Tapti. There are several different languages spoken between Cape Comorin and the Himalaya mountains, all of which are as distinct from each other in the minimum as English and French, and in their maximum as English and Hottentotty: each language has its own written character, except that of the wild tribes inhabiting the elevated tracts of Central India, who, unless I am misinformed, have no written character at all. This state of things existed prior to the invasion of the Mohammedans, who scattered the Persian character over the surface of the languages of India, in a manner analogous to that in which the inundations of the Nile are said to cast a slimy film indiscriminately over the surface of the various formations through which that great river pursues its course. Besides the difference generally pervading the language of India considered as a whole, there are several local and peculiar distinctions which cause a total dissimilarity: thus, the Banias, or traders, use a character which none can read but those of their own tribe. The character commonly called "Nagri," which is in more familiar use than any other amongst cultivators in Upper India, is not the same in one province as in another; and though there is in truth a character called the "Devanagri," or "Shanscriti," which is urged by those best informed to be free from this objection, in tracts to the north of the Narbada, yet it must be remarked at the same time that this unobjectionable character is only known to the learned, just as Greek is known to scholastics. Of all known written

characters, Persian and Arabic are perhaps precisely the unfittest in the world for any language but their own kindred, because they have several guttural sounds; because they want several consonants, and have no short vowels, which latter they express by accents; because many of their consonants are only defined by the number and position of dots placed above or beneath, which dots and accents are commonly omitted in writing, and rarely in the finest writing ever occupy their true places; because the words of a sentence are never written in continuous lines, it being considered graceful rather than otherwise to give the penmanship an easy *sans souci* wave, analogous to that of flounce or fringe, or flowing drapery, to which Asiatics are so partial; because, for these reasons, and others of a like kind, the Persian is in truth a defective species of stenography, more liable to interpolation and forgery than any other. The Hindi, on the other hand, is a very soft, and, as I think, an exquisitely beautiful language, in its grammar, structure, and pronunciation: it is full of vowel sounds, and its written character is sufficiently well adapted to express its different intonations, and though as to short vowels it is hardly better off than the Persian, yet the continuity of the lines, which is preserved altogether unbroken, gives it immense advantage over the Persian. With all these advantages, however, on its side, it so happens in practice, that if a villager from one part of the country, who happens to be employed in another part, desires to address a letter to his nearest relations at his home respecting affairs of the utmost domestic privacy, he almost invariably applies to a Persian writer to write and indite it for him in the foreign language of Persia; and the letter, when it comes to hand, has to be read for the receiver by another Persian writer before its meaning can be unfolded. Such is the little avail of the Devanagri as a general medium, and so true is it that there is no known character in prevalent use at all competent to express the different intonations of the vernacular language of any part of India.

It is not my design to enter minutely into this question, but

rather to convey a sort of general idea of its bearings. When thirty-eight learned Fellows talk to the Court of the propriety of introducing a well-digested and uniform system of Orthography, if they really mean nothing more than that such a result is desirable, they are only telling their readers what nobody doubted, and what, in fact, all men have been long agreed on. It is well enough, no doubt, for Mr. Cocker to teach youth that two and two make four; but when that sublime truth is once clearly received by the mind, as an indisputable fact, it is useless to be constantly announcing the same truth with the pomp and pride of learning; or, in the words of the Edinburgh Review, 'to get warm and cackling over the little truism;' and in the present case, it seems hardly consistent with decorum, or becoming the dignity of the Royal Society, to stalk thus unceremoniously into an arena which has been honoured by the presence of Sir William Jones.

If, on the contrary, it be really the intent of the thirty-eight learned Fellows to bring about the accomplishment of what they urge as proper, or even to do aught to advance it, the field is certainly ample before them, and the good they will bring to pass, in case of success, is such as, in my opinion, will tend to advance the civilization of India by a stride of a century at least; so that, if the search for truth be the object, perhaps it may not be deemed out of place for me also to venture to offer a few of the data on which I found my own views of the case, which are as follow:

First: The difficulty of acquiring a knowledge of a foreign language is greatly enhanced by a want of familiarity with its written character; wherefore, if there were an affinity between the written character of Indian words and those of Europe, the literary stores of the latter would thereby become accessible to those who speak the former, more or less in proportion as the resemblance approached more nearly to perfection.

Second: Of all European languages the English seems subject to the acknowledged reproach of its orthography being most

discrepant from its pronunciation (unless, indeed, the French be the very language that goes one step further than the English, which I am disposed to think is the case); whilst of all languages in the world, the Italian seems to be that which bears off the palm of consistency and accordance between these two essentials.

Third: There is in many points a resemblance between the intonations of the Hindi and Italian; and but for the perpetual occurrence of aspirates, the nasal *n*, and the short *u* of our words *cut*, *but*, &c. in the former, and their total absence in the latter, we might at times all but imagine that the one is a dialect of the other.

Sir William Jones's system seems, then, to have been, to introduce the Italian vowels into his system of orthography; and this is the method adopted since his day by the Asiatic Society of Calcutta, and, I believe, by all scientific societies which are connected with Indian affairs.

Fourth: But Dr. Gilchrist, who was the Dr. Johnson of what is called Hindustani (which is truly a sort of *lingua Franca*, or alloyed language, the result of the Mohammedan invasion), introduced a system of orthography of his own, which has many advocates, and which has to a great extent eradicated Sir William Jones's system in all but matters connected with erudition.

Thus stands the case at present, and whilst the two parties who thus espouse each an opposite system are constantly aiming the shafts of ridicule at each other, I appeal to your Royal Highness to say what profitable end is to be answered by the delivery of the opinion of the thirty-eight learned Fellows, in a disputed point, with the merits of which they have taken no pains to make themselves acquainted? I have scrupulously kept aloof from all discussions of the sort, because of the angry feeling and personality which is displayed by some, and by the interested desire to *immortalize themselves* in connection with the system they advocate, which is apparent through the exertions

of others; but I have my opinions nevertheless, and if I saw any good end likely to be attained, I too would enter as a disputant, and put in my little proposals, which are founded on the following arguments:

Maps, if printed in an Asiatic character, would not be read in Europe, and as the market in India is limited almost to nullity, therefore they would not be bought—therefore they would not pay the expense of publication.

The fewer letters by which we can spell the names of places the better; because the maps become less crowded, and furnish room for so many more names.

The sounds should be as distinct and determinate as possible, so as to leave no doubt of how a written name is to be pronounced.

Keeping these desiderata in view, I am consentient to adopt any system of orthography whatever; for though I have a theory of my own on the subject, I am quite ready to abandon it as soon as any system shall come forward which is better calculated to promote my fundamental principles.

In the present conflicting state, however, of opinions, as I have been compelled to make a choice, I have thought it best to follow in the train of Sir William Jones, and those whose pursuits are most akin to mine; and, though I do not mean to commit myself to any existing system as being faultless, or the best that can be, or even such as the confiding people committed to our guardianship by Providence, have a right to expect from the generous and disinterested character of Englishmen, yet I have strenuously patronized the introduction of the principle of Italian vowels with English consonants into the orthography of all maps; and in those of the Great Trigonometrical Survey, which has been under my more immediate control, have effectually succeeded in attaining this end.

I am not certain that this has met with the sanction of the Honourable Court of Directors; indeed, I confess that I have taken upon myself to act without ascertaining their wishes on

the matter, wherein perhaps I am to blame; but they are very lenient and forgiving, and I dare say they will, as usual, give me credit for doing right, at least quite as often as I am entitled to expect. Neither have I the smallest clue to guide me as to the tendency of the propositions, if any, made in this matter by Major Jervis to the Royal Society, which, in common with others, it may be presumed, have called forth the Address signed by the thirty-eight learned Fellows; and though it would be a sin to doubt that the ideas must have been more than usually luminous which prompted so much sleeping wisdom to shake its mane, and take so decided a part in a question which might, perhaps, more properly belong to the Royal Asiatic Society of London, yet it may, perhaps, qualify this brilliant display of ardour and zeal to learn that, if the system advocated by the Major in reality differ from mine, some years' labour more than was calculated on will have to be swept away to make room for it.

Your Royal Highness and the thirty-eight learned Fellows will, I hope, forgive me for saying that I do not thoroughly comprehend the meaning conveyed in the expressions of the Address. "Not that it is contemplated that it would be necessary to begin the work *de novo*, but merely to examine it in order to render it more complete, and to combine it effectively with future labours." If by this sentence the thirty-eight learned Fellows mean to imply that an examination is all that is requisite to be made, with the sole view of detecting deviations and errors, it seems to an unlettered man like myself, who have only the rules of plain common sense to guide me, that such a process would of itself have the double disadvantage of being not only very tedious and harassing, but of involving a very fruitless expenditure of time.

Let it be supposed, for example, that any individual who had a natural taste and fitness for that sort of examination, were, after fulfilling this desideratum, to convey to the chairman or the secretary a list of errors, the result of his patient labour; the

examination might then be considered more or less complete, and though, according to the practice of the Great Trigonometrical Survey of India, the document would need the signatures of two persons at least who were known to labour unconnectedly, yet we will set aside that peculiarity in this case, under the notion that it is pedantic and affected; and we will admit that the examination is complete, *the examiner's bill paid*, and that the precise situation where each error lies is absolutely registered in writing.

Now, what are we to do with and how to apply this information which it has cost us some time and money to obtain? The Address distinctly eliminates all necessity of doing the work *de novo;* but in many maps of districts the system of orthography which has been adopted by the Surveyor is totally different from what it is in others; and perhaps there is hardly one instance, if indeed there be one, in which any geographical data of India have the very sort of orthography which the *protégé* of the thirty-eight learned Fellows may have been pleased to pronounce as most orthodox. Either then we must resort to a table of errata, or change the orthography *in toto;* which latter, to my poor sense, differs about as much from doing the work *de novo*, as the knives which the farmer boasted he had had for forty years, except now and then a new blade and now and then a new handle, approached in identity to the original instruments.

This argument, though it has been used in reference to orthography alone, yet applies with equal force to every other species of alteration: if, for example, as may probably be expected from Major Rennell's Memoir, wherein a discrepancy of *seven minutes of longitude* is spoken of as a *trifling error*, there be many portions of the Atlas which would require not only the whole of the meridians and parallels drawn in them to be shifted, but also endless changes of relative and internal position to be introduced, to make their elements conform to the sweeping exposures which the irresistible accuracy wielded by the Great Trigonometrical Survey of India sheds unsparingly over the land where it pro-

gresses, making error vibrate to its centre, and baring the lurking places where humbug and empiricism may have taken refuge: if that should be the case, how without the *de novo* principle the work is to be approached in accuracy to the systems pursued in Great Britain and Ireland, or on the Continent, is to my humble judgment quite an enigma.

I have my own theories on this point also; but as I do not thoroughly comprehend the position of the thirty-eight learned Fellows, which it would be unfair to suppose is other than fraught with meaning; and as it would be waste of time to combat an unreal form in the dark, I shall refrain from an exposition of them until the time and occasion are more fitting: meanwhile, as the Court have done me the honour to impose on me the perilous office of their confidential adviser, I shall merely cite to them the words of the great Juvenal:

> "Evertêre domos totas optantibus ipsis
> Dii faciles."

which freely translated, for the benefit of the country gentlemen, meaneth in plain English, "Many a house has tumbled down about the ears of its occupants, because they did not know how to shore it up with judgment."

We will pass on, please your Royal Highness, to the subject of the Improvement of the Geography of India, and of the countries stretching between its frontiers and the Caspian Sea, which, amongst others, is characterised in the Address of the thirty-eight learned Fellows, as being especially calculated to the auspicious commencement of the reign of Her Majesty Queen Victoria; in order to the right understanding of which, it is advisable that I should know precisely what is intended to be implied.

By coupling two subjects which are essentially distinct, in this wise, the supposition naturally arises that the arguments which are applicable to the one are equally applicable to the other; whence it would result that the same system of topography which

the tenor of the Address leads us to suppose is advocated by the thirty-eight learned Fellows, as alone suitable to India within the frontiers, namely, the uncompromising accuracy of the Great Trigonometrical Survey of Ireland, is also recommended for adoption in that without the frontiers, or in the countries stretching between its frontiers and the Caspian Sea.

There are several objections to this, however, the first of which is, if I may be permitted the use of a law phrase, that it is not *tanti;* that is, that it would cost a great deal, and bring in little, if any, profit; the second, that persons would not be found both competent to execute the task and willing to engage in it, because with the former quality they might look for more favourable employment at less risk, and less trouble, nearer home; and the third, which perhaps the thirty-eight learned Fellows will allow may countervail all the rest, is, that it is as impossible in the present condition of things, as to make a Trigonometrical Survey of the moon or the planet Jupiter.

The truth of this last position will, I persuade myself, break out into open daylight as this discussion advances, without my undertaking to prove it separately: wherefore I will suppose that the thirty-eight learned Fellows do not intend to summons the Court of Directors to run a series of principal triangles under the auspices of Major Jervis, from Ludihana to Astrabad, and make that the basis of a net-work to include Bokhara, Balkh, Khyva, and the Hindu Kush, for the honour of Her Gracious Majesty Queen Victoria.

The proposition however must, we may presume, mean something. It is not to be imagined that thirty-eight learned Fellows would get up an Address absolutely devoid of meaning; therefore, your Royal Highness will graciously pardon me, if, in attempting to divine the cryptical motives of the proposers, I should fall into error, and assign to the learned gentlemen notions, projects, and intentions, not their own.

The paragraph, if it do not bear the interpretation which I have above investigated, can, to my humble judgment, mean

nothing more nor less than that route surveys, the oral traditions of travellers, and in fact, information of any sort that can be obtained, elucidatory of the tracts alluded to, would, in the present state of our knowledge, be desirable; all which is undeniable as truism can be, or in the words of the comedian,

"An excellent remark, Mordecai, and very new."

But it must be allowed me to remark in this place, that all things which are desirable are not attainable, and that there never was a Government which less needed to be stimulated than that of the E. I. Company, to undertake rude initial surveys of the kind herein adverted to; for when does an army of theirs ever take the field which is not accompanied by surveyors and equipped with instruments? and by what unwearied exertions did not the patient and judicious Rennell strive to reconcile the jarring and discordant data on which the map that was accompanied by his Memoir is founded?

If your Royal Highness will graciously condescend to cast your eye through the Memoir of that accomplished and able geographer, it will be immediately apparent how absolutely superfluous, nay, worse than that, how affronting it is to dictate at this hour to a body of men who have been perpetually alive to this very necessity, and have steadily pursued the object before them with a perseverance unparalleled, and which cannot be too much applauded, during the long period when the profound slumbers of the Royal Society seem never to have been invaded, even by a suspicion of what was in progress.

Then, when the thirty-eight learned Fellows, starting as from a dream or trance, begin not only to cavil, find fault with, and treat as rejectaneous what has been done in this long interval of their inglorious repose, but urge the Court to proceed in a course precisely analogous to what they have been pursuing all along, and that too in respect of countries not under their sway, with which by law they have no concern, and to which their agents cannot even gain admittance but in disguise; is it too much to

pray for a little consistency to mix up with this abundant outbreak of zeal in the cause of Geography, and of loyal outpourings for the auspicious commencement of the reign of Her Majesty Queen Victoria,—as sudden as they are inopinate?

But I perceive that I am falling insensibly into the same error with the Address, by mixing up two subjects intrinsically distinct; and as this can only tend to mystify what it is my object to render clear, therefore I shall proceed to dispose of the question of the Geography without the frontier, with the intention of reverting to that within the frontier, in its order of detail.

Amongst the thirty-eight learned Fellows, there are perhaps some who have read the travels of Burnes, of Conolly, of Woolfe, of Forster, of Moorcroft, of Meyendorff, of Jacquemont, of Moravier; and to those I need hardly state that the condition of society in the whole tract beyond the Panjab is as if the spirit of the Khalif Omar, who burned the library of Alexandria, was still dominant over the minds of the population.

Forster, who travelled there in the last century, met, as is well known, with the most insolent and contumelious treatment whilst wearing the Christian garb, which, from motives of prudence, he at length resigned for the dress of Islam. We all remember the story which he relates, of his being conveyed in a pannier on a camel, as a counterpoise to a fat woman and her child, and how, when the interesting baby gave vent to its fractiousness, the tide of maternal wrath was let loose on the head of the vile, the impure, the abominable Christian, who had bewitched her darling merely by breathing the same air and riding on the same conveyance with the little angel who was otherwise so lively and good-natured.

This, and many other anecdotes of a like nature, will serve to illustrate the difficulty and danger of travelling in that country in anywise; but that is upwards of half a century ago, and, not to give undue weight to facts of days so remote, let us turn to the more recent pages of Burnes, Conolly, and Woolfe, of whom, the two last were sold as slaves, and the first only made his pro-

gress clear, and escaped a like fate, by his adroitness and mother-wit, and by assuming the disguise of a merchant, travelling with a karawan or kafila.

Now in those countries the art of printing is utterly unknown: —they are torn by intestine wars,—the troops of the state are irregularly paid,—vassals in open resistance to the dominant power are perpetually prepared to pounce on the unwary,—fanaticism is the order of the day,—and the voice of truth, of reason, or of toleration, seems never to have agitated the air.

The state of things seems then to be little different from that in which our forefathers were immersed in the dark ages of Europe, when to eat meat in Lent was a penal offence punished by confinement and death; when men of noble degree were flogged at the cart's tail for breathing a doubt, even in jest, as to the real presence; when harmless women, old and young, nay, sometimes beautiful, were burned at the stake for witchcraft and sorcery.

Is it possible the thirty-eight learned Gentlemen can believe that in such circumstances the Court of Directors can equip a scientific expedition, with the avowed purpose of acquiring geographical information? Need they to be informed that of all classes of strangers and travellers the inquisitive are those who would be most objects of suspicion in a country where to be suspected, without friends, is equivalent to death or mutilation; and that the very existence of an instrument applicable to the purposes of surveying, would subject the party on whom it should be found to the most cruel tortures, even though he were not detected in the act of employing it in that pursuit, and were simply amenable to the imputation of dealing in the black art.

A scientific expedition is indeed apparently a hopeless speculation, unless an armed force sufficient to awe the turbulent and vindictive accompanied it, and that, under the unequivocal assent, and direct patronage of the ruling power of the state; unless, in fact, as Lord Byron somewhere remarks, the population should be drubbed into a civility very convenient for travellers.

But it is contrary to all precedent to imagine that the dominant power of any one of those states would ever be sincerely consentient to any measure of the sort; for it is a fact, of which every day's experience only brings further proof, that there is nothing whatever which so much excites the jealousy of states adjoining India, as the slightest display of a disposition to survey and spy into the nakedness of the land, which they universally believe, and with how sufficient reason gentlemen may judge, is but a preliminary step to assuming possession; so that, if the attempt were made, it would in all probability end in the massacre or mutilation of the whole party, either overtly, or clandestinely, by the Government or its agents; and the headless trunks, or the sacks filled with the noses ears and limbs of Englishmen, would be the sole trophy to grace the auspicious reign of our honoured Queen Victoria.

How needless then it is for the thirty-eight learned Fellows to intrude their summary dictates, and officiously intermeddle in an affair which is in hands better able to manage it than theirs, will be apparent from the fact, that when, but a few short months ago, the obstacles were removed, and that Shah Suja, backed by a contingent force, raised for his service, and officered by Englishmen, and by a gallant body of all arms, fifteen thousand strong, since denominated "The Army of the Indus," crossed that classic river to take possession of the throne of his ancestors at Kabul, the object ranking first in importance which the Governor-General resolved to provide for was the full equipment with instruments of the gentlemen to whose care were committed the geographical and other scientific details of the expedition. But herein his Lordship has only acted in keeping with what all his predecessors have done; for I can call to mind no instance of any considerable force taking the field, with the avowed purpose of marching into lands imperfectly known or unexplored, wherein a similar precaution was unobserved. Let us look back to the year 1834-5, when an expedition was sent to the Shekawati country, to settle some disputes with the state of Jodpur:—the main end

of that expedition, though really of war, seemed as if it were solely the extension of geographical information, for to that object everything else was made to give way, and treated as subordinate. Nay, in fact, until a comparatively recent date, there was a general order existing, that no corps should ever take the field, even for the purpose of marching from one station to another, in the ordinary duty of relief, without being provided with a perambulator and pocket compass, at least, if not a theodolite and sextant, under charge of such Officer as might be pronounced best qualified of those on the spot to employ those instruments in route surveying.

Hence has arisen the inferiority of the materials at the disposal of the Court of Directors, and the difficulty of the task that Major Rennell had to deal with, in endeavouring to combine data of such very various shades of character; for though some persons did, no doubt, in downright earnest make a field-book, in which they registered solely what were, or what they thought were facts, yet others, less burdened with that weighty thing called conscience, seemed to think it much more simple to draw a map and a field-book, as an indispensable prelude to drawing the salary, and leaving to after-investigators the knotty difficulty of discovering the amount of agreement between these two bantlings of their imagination.

This is the certain result in a greater or less degree of route surveys, which, like the scaffolding of a building, or centering of an arch, can only be looked on as preparatory to the erection of the permanent edifice, and not as part of the edifice itself; for if there be one affair in life to which Mr. Babbage's chapter on cooking, fudging, and such like ingenious processes, is more applicable than another, this is that very one.

But with all this, I submit to your Royal Highness that the E. I. Company's Atlas may fairly compete in point of accuracy with the maps of Europe of fifty years ago, or even with that of Great Britain and Ireland prior to the commencement of General Roy's operations; and if this be undeniable, as it seems to my

poor judgment, would it not be fairer to expect something more like parity in the states of civilization of the two countries, before the learned Fellows contend so clamorously for exact similarity in matters of Geography?

For example:—instead of being in her existing condition of semi-barbarism, ignorance, and superstition, let it be imagined that India were at this instant on a par in respect to civilization with what Great Britain was fifty years ago; then the law of parity would impose on her rulers the duty of being about to commence an extended series of Trigonometrical operations. Or to test the case by reversing the picture, let our glorious England be conceived descending from her high rank amongst the nations to occupy the place which India did in the same scale, at the close of the last century,—a metamorphosis which would bring things down to the time of the Plantagenets or Tudors; then the same law of parity would require of England to do at least as much as India did in the like state of civilization, and so it would be as reasonable to clamour against the former, for not having commenced a rigorous Topographical Survey in those days, as to make the omission a matter of reproach to India in the present.

Then, I submit to your Royal Highness, the labours of the Court of Directors are not so very contemptible after all; and, considering the state of war, the struggles for bare existence, the debt contracted, the falling-off in the revenues, and the daring bold position which a handful of Englishmen hold amongst multitudes numerically sufficient to devour them all at one meal, and still ask for more,—they are rather entitled to the applause of their countrymen for what they have done, than amenable to censure for what they have not accomplished; and this would be the case, as I opine, even if they had not to boast of having been the principal champions of St. George in the field of Geodesy, in connexion with the figure of the earth, for the last forty years; during which long period they have never been greeted with one sympathizing cheer of approbation from those of the bystanders who were most bound to encourage them in their arduous contest.

Cast your eye, I pray your Royal Highness, over the vast domains in the East which own to this anomaly of history, and remark how much still comes under the head of *terra incognita* even within the limits, nay, in the very heart of the E. I. Company's territories. Then turn to the side of the Birman empire, and note how much the tracts but recently subdued are in need of exploration, even on the score of watchfulness and precaution. Observe the progress of a large army to the westward, over tracts little known, if at all delineated, which yet the mere consideration of safety from aggression calls on the Government to invade, and then say, if the control of this mighty empire rested on your responsibility, and your character was at stake on the issue, which of the multifarious objects enumerated in the distracting list of the thirty-eight learned Fellows you would think most urgently needed your care. Your Royal Highness, I persuade myself, could not fail to recur to the maxim, that 'self-preservation is the first law of nature:' and on the same principle which induces each man to get wherewithal to maintain his existence first, and seek the luxuries of life afterwards, you would postpone considerations of extreme accuracy to the acquisition, even in a crude state, of such information as was needed to enable you to preserve your position. Am I right in this supposition, or have I misconstrued your Royal Highness?

It cannot, however, be imputed to the Court of Directors, that they have shown any disposition to avail themselves of the shelter afforded by the barrier which the strict law of parity would establish: on the contrary, accurate topography has progressed through all their wars and all their troubles, with a steady and uniform march; and, notwithstanding what ignorance may assert to the contrary, it will perhaps be found on calculation, that at least as much has been done in respect of area as in any other country.

It was not until the war of 1817-18, in which the master genius of the Marquis of Hastings broke the neck of the Mahratta confederacy and dispersed the elements of the Pindari

hordes, that Central India was more accessible to Englishmen than the states bordering on the Oxus and Jaxartes are at the present day. Nay, even so late as 1819, in my first essays, I was occasionally necessitated to carry on my operations in the territories of the Nizam at the point of the lance; yet, prior to this, not only the Great Arc, but the subordinate Series of Yerakonda had been brought up to the parallel of 18°, and stood ready to advance the moment the favourable occasion presented itself.

If your Royal Highness will graciously recommend to the thirty-eight learned Fellows, who are so eager to apply the spur to the willing steed, to seek access to the records in the India House, they will learn enough from the volume of the Report transmitted by me in 1832, regarding the labours of myself and my predecessor, to absolve me from the necessity of all detailed description of what had been done as high as the parallel of 18°-19°; and if my printed work of 1830 has not entirely come down to the trunk-makers, the dry grocers, or some still more ignoble condition, they may learn on consulting it that the Series of the Great Arc was conducted by me in 1824-5, to Kalianpúr near Sironj, in parallel 24° 7′.

From this point we will take our start, and proceed to consider what has since been accomplished.

First: A Longitudinal Series of Principal Triangles was carried on during my absence in Europe by Mr. Olliver, of whom I make mention in my book, emanating from the Sironj Base, and terminating in Calcutta, a distance of near 680 miles, to which the finishing hand was put by the measurement of a base of verification by myself and my assistants in 1831-2.

Second: From each of the principal stations, Budhon, Ranghir, Amua, Parisnath, and Karara, of this Longitudinal Series, a Meridional Series has been made to emanate, of which, the second and third, running northward, verge on completion, as does also the fourth, running southward, whilst the first and last are but partially complete.

Third: The Longitudinal Series commenced by me in 1822,

and suspended by the death of Lieut-Col. Lambton, (vide my printed book, page 25,) with the object of connecting the Presidency of Bombay with the Great Arc Series, was resumed by Capt. Shortrede, of the Bombay Infantry, in 1828-9, and has been completed by Lieut. Jacob, of the Bombay Engineers. When circumstances allow, the principal stations of this will be used as starting points for Meridional Series.

Fourth: For the last twenty-four years a Topographical Survey, under Capts. Garling, Morland, Hill, Du Vernet, and other Officers, has been employed in filling up the details of the principal triangles thrown by Col. Lambton and myself over the territories lying between the Godavery and the Kistna. This work is still in progress, and is in very able hands, namely, of Officers of the army, who, though all of the Infantry, do not seem to have ever stood in need of being instructed by Capt. Tate in surveying and drawing, as the two Infantry Officers his assistants (vide pp. 2, 3, of that gentleman's letter, dated 12th September, 1838) appear to have done: in fact, the late Col. Mackenzie excepted, my office records show no instance that I am aware of, of any but Infantry Officers having been employed in the Survey Department under the Madras Government: and yet it is universally undenied that the Topographical System of that Presidency surpasses all others in India; whence, as the instance cited by Capt. Tate is unquestionably an exception, I must object to its being advanced as a criterion of the general rule sought to be established, as altogether illogical.

Fifth: Topographical Surveys of Nellore as well as the Salem and Baramahl Districts are also now in progress under the Madras Government, under Infantry Officers; and, in fact, as the relative inefficiency of any class of men would be best defined by a fraction, of which the denominator is the whole number employed, and the numerator the number of failures, perhaps it would be more prudent to avoid going deeply into a disquisition which would be at the least very invidious, and might end in the discomfiture of the aggressing party.

Major Jervis's Survey of South Koukan, for example, is in my office, and at this instant lying on my desk, and it does not contain much to boast of. If I hear any more of this, perhaps I may feel myself bound, as the head of this department, to take up the cause of my subordinates, and commence by contrasting that gentleman's performances with those of the Infantry Officers whom he holds so cheap; for though not of that branch myself, I will not sit quietly by whilst injustice is perpetrated towards a gallant body of my fellow-soldiers whose natural protector I am. Did the thirty-eight learned Fellows themselves examine into Major Jervis's proficiency as a Surveyor before they publicly proclaimed that he was entitled to their confidence and to that of the Court of Directors?

Sixth: Since my assuming charge of my present situation in 1830, the following Surveys on the Madras side of India have been completed in the same style, so creditable to the Government of that Presidency:

Of the Northern Circars or Ganjan ..... Completed in March 1833;
Of Trichinopoli 1833-34;
Of Madura ..... April 1832;

all by Infantry Officers, whose names I have on my desk at this instant, and am prepared to furnish if required.

Seventh: The Revenue Surveys of Bengal seem to have been originally set on foot for the use of those engaged in the collection of revenue: they are not under my orders at all; and it is clear to my apprehension that so long at least as I am employed in a confidential capacity by the E. I. Company, it would be highly indecorous for me to offer to the public comments regarding the proceedings of my masters, for which, in the meantime, I am willing to assume that they have sufficient reasons. They are all conducted by Officers either of Artillery or Infantry.

With respect to the operations on the Great Arc Series, it seems to me superfluous in this place to offer any details to your Royal Highness. It is plain from the Address of the thirty-eight learned Fellows that even in the simplest and most obvious

points, my pretension to discretion is at a very low ebb indeed in their estimation; for which instance of complaisance, the best return that I can make is to say, that they are welcome to think what they please. My work will, perhaps, if I live long enough, be exposed to the blaze of daylight, when there will not be wanting a thirty-ninth who will be able and willing to appreciate it, and, if I am alive, to defend it.

Meantime, as the life of man is at all times precarious, and particularly so in the dangerous career of the Great Trigonometrical Survey of India, I look with confidence to your Royal Highness, if the time should intermediately arrive that I am laid low and no longer able to defend myself and my pretensions, to make it your especial care that my successor limits his claims to what is executed after my departure; and that either of my assistants, Lieutenants Waugh, Renny, or Jones, who have been my companions and the sharers of my toils, may be received as the historian of what has been performed by myself or under my management.

I have the honour to be, &c. &c.

George Everest.

LETTER VIII.

" And the king of Israel answered and said, Tell *him*, let not him that girdeth on *his harness* boast himself as he that putteth it off." 1 KINGS.

MAY IT PLEASE YOUR ROYAL HIGHNESS,

It will now be in place to consider that paragraph of the Address in which the thirty-eight learned Fellows strongly recommend *Major Jervis's proposition for the organization of an establishment of men and officers, under Colonel Colby, R. E., as well worthy of the encouragement and favour of the E. I. Directors,* and state that *they feel it their duty to make common cause with the proposer*, which, standing as it does in the pamphlet in juxtaposition to that gentleman's letter to Mr. Secretary Melville of the 6th August, may in fairness be concluded to have a kindred meaning with it, and therefore to give the unqualified support of the Royal Society to the whole of that letter, which I may accordingly cite as the thesis of my argument.

After eulogising the system of Colonel Colby and declaring the universal assent of *those most deservedly and highly honoured for their judgment* to its superiority over every other, the writer proceeds to say, " To whomsoever the merit of the first idea or principles of this admirable system be due, is quite irrelevant to my present purpose. I should consider it trifling with this important question, and with the patience of the Honourable Court, to discuss a point of so little utility. It is sufficient to

say, that the system pursued on the Ordnance Survey of Ireland is avowedly superior to others; but the credit of discovering and pointing out its peculiar applicability to the wants and circumstances of India is indisputably and exclusively my own."

Now I submit to your Royal Highness that if to agitate the question of originality of any design whatever be confessedly trifling with the patience of the Court of Directors, *à fortiori*, the claim for mere copying from that design must be a very humble pretension indeed whereto to draw attention; a position which those who would deny must be prepared to maintain that a modern copy of the Madonna di San Sisto, or Della Seggiola, is at least equally valuable with the original.

Wherein Major Jervis has displayed this *discovery and pointing out of peculiar applicability* I am not informed: certainly not that I can discover in the pamphlet, nor in any of the documents bound up with it. But before speaking so roundly and in terms so peremptory, it might have been quite as becoming to ascertain whether this question had ever been brought to the notice of the Court of Directors before; for if the writer had taken that trouble, he would have found reason to speak with more caution, under the impression that I also might eventually have something to say in the matter, although too far distant to controvert the position on the instant of utterance.

If Major Jervis had taken this essential precaution, he would have learned, that in a Memoir which I drew up and submitted to the Court in November 1829, I entered into an explanation of the system pursued by Col. Colby, having by express desire of the chairman, and at the expense of the E. I. Company, made a journey to Ireland in the preceding summer, and accompanied Col. Colby in a tour of inspection, with the object of making myself acquainted with its working.

On the occasion in question I recommended that system strongly to the notice of the Court; and since my arrival in India in 1830, hardly a year has elapsed without one or more endeavours on my part to draw the attention of the Supreme Government to

the propriety of its introduction; but I never thought of founding a pretension to originality or distinction on such a support as this, nor should I have ever deemed it becoming me to say so much as I now do, had it not been wrung from me by the necessity of meeting this unqualified assertion by an appeal to facts which are on the spot, and will appear on search.

I do not know whether it is perfectly legitimate to cite as authentic the reported occurrences at public meetings as delivered by the English newspapers; but the Agra Akhbar, which may be safely relied on for its fidelity in making extracts from such papers, contains a singular account of the same speech which forms the basis of Major Jervis's pamphlet, and which I here take the liberty of inserting, in order that it may be denied if inaccurate.

The following is an extract, as delivered in the Agra Akhbar of the 7th February, 1839, from the Report of the Eighth Meeting of the British Association for the Advancement of Science:

"We hear of famines, of over-taxation, of insurrections, of idolatry, of the impediments to steam navigation, of the stagnation of commerce. We hear of this here, and many persons conclude that the E. I. Company and the Government of India are at no pains to obviate them: far from this, they deeply deplore the existence of these evils, and would gladly resort to any expedient to remedy them. Such remedy, I conceive, is but to be found in a complete and good survey, accompanied with every sort of useful, statistical, and geological information, which can throw light on that country; and such survey, with proper aid and proper confidence, I think it possible to accomplish in seven years, and I hope to live to perfect it."

Now, if in this case the reporters have done their duty and truly delivered to the public what was uttered on that occasion, I submit to your Royal Highness that Major Jervis has by implication pronounced the most severe censure on this very system pursued in Ireland which in his letter to the Court he so vehemently eulogises, and the mere reflected lustre of which he so

eagerly covets; for it is very clear that, *cæteris paribus*, the rate of progress of such operations ought at least to be common to both Ireland and India; in which case, the time required for the completion of an accurate topographical survey must be in the direct ratio of the areas of the two, and in that ratio only.

Now, according to the Distribution Map which I caused to be constructed in my office at Calcutta in 1832, the area of India Proper (not including therein the territories acquired from Birma since the war of 1824-5-6, nor Penang, Malacca, Sinkapur, &c.) is as follows:

Territory actually subject to the E. I. Company, square miles...	626,745·6
Area subject to native states in alliance or influence of diverse shades	449,845·1
Total area in square miles	1,076,591

With this amount we are to compare the area of Ireland, which I have not the means of knowing so accurately, though of course the able Superintendent of the Great Trigonometrical Survey of that country will find no difficulty in doing so; wherefore it is of the less consequence if I should err in assuming it at 30,369 square miles, because that is, I presume, very near the truth, and those who desire a closer approximation can easily make it for themselves.

Hence $\frac{30369}{1076591} = \frac{1}{35\cdot6162}$ is the ratio sought, and if we take the year at 365·25 days, and multiply that quantity by 7, we shall obtain 2556·75 days, which multiplied by the ratio will give 71 days, 23 hours, 43 minutes, 7·003 seconds, nearer than which it will perhaps be needless to carry the operation: but I am willing to concede the odd seconds, though, as I shall hereafter show, the concession of however small amount ought, from local consideration, to be entirely made from the opposite quarter; and there will then result the round period of 72 days, within which (bating errors in the premises), it is clearly Major Jervis's opinion that the survey of Ireland ought to have been completed *cæteris paribus*.

I do remember me well of the school-boy lines, which I learned in my early days,

> Multiplication
> Is a vexation,
> Division is as bad;
> The Rule of Three
> Doth puzzle me,
> And Practice makes me mad.

But, please your Royal Highness, there is nothing like coming down to the vulgar rules of arithmetic, and Mr. Cocker, after all, is the most sturdy and irresistible of demonstrators; there is no evading his stern uncompromising logic.

Such being the case *cæteris paribus*, if the Irish Survey, instead of 72, has taken actually n days, the excess must be clearly attributable to the circumstance that the superintendents and agents employed in that work are inferior in the celerity and activity of their movements to Major Jervis, the mainspring that is to be, and the agents whom he purposes to act withal in the ratio of $\frac{72}{n}$; but if for the terms *cæteris paribus* we are now to substitute *omnibus imparibus*, even this ratio will not suffice, small as it is.

I have for my own part ever felt the most unfeigned and unbounded admiration of Col. Colby's system, which was in nowise diminished by my visit to Ireland in 1829; for the cordiality and kindness with which that Gentleman and all his Officers received me could only be equalled by that manifest air of frankness and candour which reigned through the whole department, and showed at a glance that they courted publicity and had no secrets to hide—no nakedness of the land to keep strangers from spying into—no mystification—no affectation of secrets of trade: besides which, the gentlemanly style of subordination, whereby the Chief was absolutely at ease amongst his Officers who looked up to him as a friend, and whom he treated as such; the total absence of all mean weak-minded jealousy, and of all external pomp and pretence of ill-timed state,—through

all which it was still to be seen, that in matters where duty was to be done the law was potent and effectual.

These things convinced me that Col. Colby was a person very fit to be entrusted with power, and so it seems the Duke of Wellington thought also, with his Grace's usual foresight; but it does not follow as a necessary consequence that every person is fit who seeks that perilous position; and of the very few who are so when tried, least of all are those likely to prove so who evince the greatest avidity to possess it.

But though Col. Colby's system was excellent in theory, and had proved no less excellent in its practical working in Great Britain and Ireland; yet, please your Royal Highness, if I may be allowed the expression, it was but the solution of an equation, with particular values to the coefficients: it was not intended for universal application, and to take that system without modification, and attempt to introduce it into practice in a country where the whole circumstances and features were entirely different, would be no less absurd than to apply the relative numerical values of the ordinates and abscissas, determined by the equation $ax = y^2$, to those of the equation $px = y^4$, because they both came under the fundamental form $a^{m-n} x^n = y^m$, or to make mango trees and gooseberry bushes change situations with each other.

I may be mistaken certainly, but it seems to me that the merit claimed by Major Jervis is that of a proposal to copy servilely from Col. Colby's system, of which, if that be the case, I have no disposition to deprive him of any portion; for it has always been my opinion that the wit is shown rather in endeavouring to trace the principles of the fundamental equation, as they stand involved in its solution, and after separating the effects of the arbitrary coefficients, to obtain a new solution with coefficients derivable from the new conditions.

To this latter object my attention has been uniformly directed, but with what success it would, for most obvious reasons, be unbecoming in me to say, because no man can speak impartially of

what relates to himself. In the fulness of time the truth will no doubt make its appearance, but whether it should or not, I value a quiet life a great deal too much to make any effort upon a subject to which I attach so little importance; and I only hope that if my successor should ultimately find it necessary to avail himself of the system which I have introduced, in order to make some show of amends for the too certain abortion of his own, he will have the candour to avow that he then also only plumes himself on shining by secondary rays.

To illustrate what I mean by the coefficients, equations, general and particular values, and all this seeming jumble of hard terms, —for the benefit of the country gentlemen,—I must remark, that there are certain general principles which seem to pervade mankind universally, which form, as an elegant French writer tells us, "*the base of the human edifice, a real genuine and immutable world, but which appears fictitious and foreign to the society of convention, the political society.*" Of the first of these, with the introduction of general coefficients, I consider the general equation to be formed; and of the latter, the particular values of the coefficients, which are functions only of the existing circumstances by which the society is surrounded and defined.

Now, in the first place, there is the most marked contrast between the natives of India, their habits, their moral code, their manners, their customs, their traditions, their religion, as also the climate of the country they inhabit, and those of any European nation, or in fact of any other people of this planet. The English and Hindus are the very antipodes of each other in their national characteristics: of all races on earth they present the fewest points of similitude. A Hindu is taught to deem it the greatest crime on earth to kill a cow. An Englishman likes no better fun than to kill a cow and eat it afterwards, especially if it is fat and plump, and in good stall-fed case. A Hindu of high caste, a Brahmin for example, is taught to believe that putting a low caste man to death is a mere venial offence, to be compounded

for, when the low rascal has not by his impudence provoked his death, by a small fine: reverse the picture, and let the low man strike or even look impudently at the Brahmin, it is death or mutilation. I need not tell your Royal Highness how differently Englishmen view such a matter as this.

Amongst Mohammedans, eating pork is considered the vilest act of sin and impurity that can be committed on earth; and the codes both of this race and the Hindus run into so many divergent ramifications, founded on like false notions, that none of either tribe will eat what a white man may have touched, who will not subscribe to their rules.

Gentlemen who desire to inform themselves more particularly on matters of this sort, (and those who do not are, I submit to your Royal Highness, in a false position when they claim a right to dogmatize about India,) must consult Mr. Mill, Mr. Ward, M. Dubois, Sir William Jones, and Mr. H. Colebrooke, for I have not time or space to do more than skim lightly over facts; but from these differences it arises, that when an Englishman arrives in India, and finds himself accosted by a set of people, whom he looks on as *Niggers and Infidels*, and who are generally as naked as Adam and Eve were after they had become used to the application of fig-leaves, and as dirty and offensive withal as cow dung, cow urine, coconut oil, and other filth can make them, but who, nevertheless, look upon themselves as pure *par excellence*, and the White arrival as impure by convention: an Englishman under such circumstances very often gets wroth at so preposterous and impertinent a pretension, and having no means of expressing himself, and conveying a clear notion of his impressions *viva voce*, the fist is very commonly applied in such cases to communicate them to the aggravating pretender—a remedy which would have a better chance of being effectual, if the numbers were nearer on a par; but as the Natives have it all their own way in that respect, is not so good a remedy as patience and good humour.

I do not know so aggravating, so quarrelsome a people to

strangers as the Natives of India are, especially to those who cannot speak to them in their own language. I have seen them in Java, in Malacca, in Penang, on board ship; and every where the same pretence of imaginary superiority makes them objects of dislike and abhorrence to strangers. Yet they are conscious of the superior rectitude of Englishmen, and come to us to settle their disputes, in preference to their own kindred folks; and when we come to understand enough of their language to be able with safety to be jocose, and talk to them in their own way, in sounds that do not jar on their ears, without the prospect of making ourselves objects of ridicule and mockery by our blunders, we find that at the bottom there is a deep-rooted and sincere reverence for the English character, almost approaching to veneration.

This is, as I take it, the hold which Great Britain has on her Indian possessions; and gentlemen who know nothing more about the matter than the Frenchman who has been captive on board a prison ship knows of Great Britain, may talk as they please; but it is my conclusion, and few persons have had better opportunities of informing themselves of the truth, that if the general voice were taken to-morrow about who should reign, there would not be 10,000 dissenting voices opposed to the English, of the large population of India.

When, however, we reprobate the idle clamour and calumny which is as frequently as causelessly poured forth against the Government of India, and see their best measures distorted into the causes of famine and insurrection, by perverse or interested men, we must at least in candour admit that there is as much reason and logic on the side of the promulgators of these absurd slanders, as on the part of those who propose *a complete and good survey* as a general panacea for earthly ills and visitations of nature; so that, if we denounce the former, as spouters of froth, venom, and untruth, we must at least concede to the latter a claim to fair and equal rank with the *learned gentleman* who sells his universal nostrums and specifics to the country bumpkin, and other frequenters of rareeshows.

Time was, perhaps, when a scientific assembly in our glorious England would hardly have suffered the dignity of their presence to have been trenched on by the unquestioned utterance of such empiricism; and some one or more of the audience would have stepped forward to advise the speaker to consult the pages of Adam Smith, of Malthus, of Godwin, of Sadler, of Jones, of Place, to search for the occult causes of the evils which he laid to the absence of Topography: but now the moral lessons which were read to us in our youth appear to have been discarded by the learned and wise of our nation, and we seem, in the pomp and pride of the march of intellect, to have trodden under foot the fable which must once have been familiar to us all, that

> "A town was besieged, and held consultation,
> Which was the best mode of fortification.
> A grave skilful mason gave in his opinion,
> That nothing but stone could secure the dominion.
> A carpenter said, that that was well spoke,
> But 'twas better by far to defend it with oak.
> A currier, wiser than both these together,
> Said 'Try what you please, but there's nothing like leather.'"

But believe me, your Royal Highness, the simple truths are, after all, the most deserving of our attention, for they constitute the chief materials of what M. Chauteaubriand has taught me in his elegant similie above referred to, to call *the base of the human edifice, the real genuine and immutable world.*

That this is digressing, however, I am aware, wherefore we will return to the main subject; and first of all we must come to the conclusion, that the necessity of learning the languages of India, such as they are spoken by the cultivators, is absolutely indispensable to those who desire to obtain accurate statistical information, or even to save themselves from starvation in utter helplessness to ward it off.

When I speak of the languages of India, I do not mean that sort of dog language which is acquired at Addiscombe Seminary, by the youths who are to show off at the half-yearly exhibitions;

for the choicest and best Hindustani or Urdu, which is what is taught there (the word Urdu meaning an encampment or Horde), is of as small use in the villages in any part of India, as the best French would be in Berlin or Naples. Now, what is acquired at the Addiscombe Seminary is not the best or even an approximation to the best Hindustani, but is so indifferent that a gentleman of the Direction whom I had known in India, and who sat next to me by accident amongst the spectators at one of those examinations, asked me with pure *bonhommie*, what language the gentlemen Cadets were reading in? I replied, that "it was intended for Hindustani, for by a little pains and stretch of imagination, I could trace an affinity." "Well! that is very odd," said my friend; "I used to speak the Hindustani fluently and constantly enough when in India, but I have not been able to make out one word."

Now if this be the case with respect to the gentlemen for the teaching of whom some pains are avowedly taken, what may be expected from the seventy Sappers and thirty Civilians to be instructed by Col. Pasley, into whose system of tuition the languages of India do not enter at all as an element? Is it not evident to your Royal Highness that they will come out to India as little able to officiate in the Surveying Department as men dropped from the moon would be?

This subject of language therefore is, I submit to your Royal Highness, an essential item of difference, one of the *omnia imparia* of which I spoke e'en now, and which will go vastly to diminish the ratio last found of $\frac{72}{n}$; for though the Court of Directors may, in the plenitude of urbanity and complaisance, concede this mighty wonder-working machinery, yet their local Government of India are far too clear-sighted to admit of the close contact of raw Englishmen with the inhabitants. Perhaps his Lordship in Council may, as is not uncommon, consult me—and then—and then he will certainly not do so without expecting to hear the plain straightforward expression of my opinion, in the manner becoming my countrymen.

I will, with your Royal Highness's leave, now proceed to examine another bearing of this difference of language; for the slightest inspection of Col. Colby's system will show that the language used in all the records and proceedings, of any sort whatever, is intelligible to each and all of those employed in the working.

Now it is not exactly clear from the pamphlet and its associated documents what Major Jervis proposes; for in one part he leaves us to infer that the work is to be accomplished by means of Natives, and in another, by the agency of three Captains, five Subalterns, seventy Engineer Soldiers, and thirty Civilians; wherefore we will in this state of doubt investigate the consequences and progress of each.

If Natives are to be employed as the prime agents, either their language and written character must be used, or they must learn English. If the seventy Sappers and thirty Civilians are to be the chief agents, either the English must be that of registry, or they must, as a preliminary step, acquire an accurate knowledge of one at least of the many dialects of India—*Urdu* for example, which, as I said before, overspreads the surface of the rest, like the slimy deposit of the Nile.

The first of these modes would tend to remove India still further from connexion with and access to European civilization and science; and as none but a person very far gone in pure higgledy-piggledy philanthropy (a failing of which the Royal Society certainly are least of all liable to be accused) would entertain it, as I judge, therefore it may be dismissed from our discussion as burdensome, and left for the well-meaning controversialists of the press in India to pine over, and found an accusation against me whereon, as an enemy to the improvement of the Hindus and the perpetuation of the divine language of the Shastras.

Now an acquaintance with the English language is daily gaining ground amongst the Natives of India, but a fundamental knowledge of it is confined almost entirely to the immediate

vicinity of Calcutta, Madras, and Bombay. It is a fundamental knowledge, however, which alone suffices to change the moral code, and substitute English principles of rectitude, honesty, and a love of truth, for the low habit of trickery, chicanery, and attempt to deceive, which, like a deadly parasite, clings round the social system of India.

When Natives can be met with who come under the influence of this fair change, I really must assure your Royal Highness that, proud as I am of being an Englishman, (and no man is prouder,) yet I have never seen persons more amiable, who have a more strict regard to the truth, greater sobriety, more amenity of manners, and more general intelligence combined with modesty, than they seem to be possessed withal. Of all that I have seen, the youths educated at the Hindu College stand proudly preeminent in these respects; and I am forced to concede (which I should not do hastily, for it is contrary to my first impressions, formed prior to the irresistible proof furnished by that Institution), that such persons have a purity of heart and a soundness of understanding which I have never seen surpassed, and rarely equalled.

But the Government of India are not so shallow-sighted as to be insensible to the worth of persons of this class. I never succeed in training half a dozen of these College élèves in my Computing Office, but a sudden call comes, and they are all drained off in a body to fill high and responsible situations in the Revenue Branch, on salaries exceeding those which I give in the ratio of 9 to 1, thus crippling my operations for the time being, and leaving me, as a sole consolation, the barren compliment that the preference has been given to them because they have been brought up under my system.

Besides this, though I do not know what may be the exact state of feeling at the other Presidencies, yet at Calcutta the Bengali élèves of this class have an almost insuperable dislike to quit their homes and their native province; wherefore to employ them to any extent in the present circumstances, would be by

far too costly to be thought of; and if it were otherwise, they are far too high-spirited and independent to be prepared to cringe and bow and play the obsequious before raw Englishmen of the class from which the seventy Sappers and thirty Civilians would in all probability be drawn.

Therefore we come to the conclusion that all the inferior parts of the drama must be enacted by genuine Natives, or, as the Americans significantly call them, *Niggers;* persons who may speak in a half-smattering of broken English perhaps, but whose ideas, habits, and language of common parlance amongst themselves are exactly what they have derived from the unadulterated impressions of their early youth. Of these, few can write or read any language at all—perhaps one in a thousand may be able to read what he has himself written, in the Nagri or other vernacular character, which is considered a very great attainment,—a thing to be proud of, and looked up to for; but there still are more than enough to meet the demand, and consequently writers of the Hindi, Persian, Telinga, Tamul, Canara, Mahratta, &c., are to be met with at sufficiently cheap rates; but then I pray the result may be marked:—such people are mere writers, and are rarely, most rarely, fit for any thing else but writing and trickery.

It behoves us next to consider the intermediate class which is found in India, who, after making it a long subject of testy discussion and choleric objurgation as to what name they should be called withal, have at last come to the conclusion, that the designation of East Indians is best suited to them to assume.

The White population floats like oil over a surface of water, but the fluid beneath still contains a solvent, whereby the lower particles of the upper stratum which come into contact with it, are gradually but surely taken up, thereby softening off the original hard outline of separation, and, without destroying the individuality of either stratum, making it difficult to decide the precise point where the one begins and the other ends.

The transition portions are the East Indians of whom I speak; and finer, better materials wherewith to form an establishment for the purposes of surveying I do not think will be found in any country.

It will have easily been drawn by your Royal Highness from what I have above stated that there is nothing really and radically corrupt about the native character; their indigenous and untutored vices, as they meet our eye, are all those arising from a bad system of early education; change that, and they are as susceptible of virtuous impressions and probity as any people on earth. Now if this conclusion be not the result of mere blind enthusiasm on my part, and that of those who think with me, and who are not few, *à fortiori*, when we come to superadd thereto a portion of English sternness, manhood, resolution, and vigour, there is no reason to suppose but that we rather improve than deteriorate, and do not generate, by the communication, vices and defects which are not intrinsically interwoven with either stock; an argument which your Royal Highness will immediately see is analogous to that whereon M. La Grange has founded the proof of his *Theorie de Fonctions Analytiques*, in extricating the values of the coefficients, or derived functions p, q, r, &c.

I have an establishment of twenty sub-assistants, besides one chief civil-assistant and two principal sub-assistants, under my orders, of whom about eighteen are East Indians trained entirely by myself; two are natives (one a Bengali Brahmin, the other a native of Arcot); and the remaining three are Europeans, genuine importations from England and Ireland.

I allow no distinction of birth or religion, faith or complexion, to operate, but it is my effort to leave a fair field to all, and show favour to none: all rank, take precedence, and exercise authority according to their seniority; and it is a spectacle calculated to gratify any but those wedded to a particular notion, to observe how well all parts of this diversified machinery harmonize with each other; for there seems to be but one

common feeling actuating every member of the Great Trigonometrical Survey of India, which is, to gain the approbation of their superiors by meriting it.

Such, please your Royal Highness, are the elements of the transition-stratum of my metaphor, or East Indians—hardy, honourable, active, enterprising, energetic, sober, and intelligent; possessed withal of constitutions suited to the climate (under the influence of which the uninured European sinks and withers as a blighted leaf); and habituated to speak home to the hearts, feelings and understandings of the inhabitants in that language which, to the untaught Englishman's ear, is unmeaning and outlandish gibberish. Such are the elements from which I have succeeded in forming the *nucleus* of an establishment which your Royal Highness has been led to suppose impracticable. Such are the elements which the thirty-eight learned Fellows have done their utmost to set aside, and cast into contemptuous obscurity, that there might be a clear field for Major Jervis to initiate his aërial and imaginary schemes whereon.

Those who have been trained under my system would never submit to the indignity of being superseded by the *fiat* of the Royal Society, nor would the Government of India ever be so blind to justice as to give their sanction to such a procedure. It is impossible—it is inconsistent with all the precedents we have to guide our judgment regarding their actions and the principles which regulate the conduct of the Court of Directors towards those who have served them faithfully, to suppose that such an enormity could ever be tolerated by that Court one instant after its practical effects were brought home to their knowledge.

It is not, please your Royal Highness, that the members of this establishment of whom I speak are dependent on their situations: most of them are sufficiently well connected with relations who are able to maintain them decently until they can suit themselves with better employment, if that which they hold should become irksome to them; and, talented as they are,

and backed as one and all should be by all the force which my poor recommendation and my small influence may carry with them, they would not long have to search for a respectable livelihood in a transition state of society like that of India, where useful energy and acquirements of the kind they possess are in so great request, especially when it were generally known that they were victimised solely to make room for the experiments of the *protégé* of the thirty-eight learned Fellows.

This is, however, to argue on an hypothesis which it is very certain the Court will never allow to come to pass: the probabilities are that I should be consulted before any irremediable steps were taken; and then—and then those who have put their fortunes in my keeping should not want an advocate.

It will, however, I doubt not, be gratifying to your Royal Highness to know that no harm can eventually happen, and some good will perhaps result, though hardly commensurate with the expense incurred by the Court, from the transmission to India of the seventy Sappers and thirty Civilians. Men of that class, that is, intelligent Englishmen, are naturally in request, and they will most probably be absorbed, sooner or later, into other departments, where they are greatly needed, and where higher wages and better prospects will be held out to them than the Survey Department can afford. For the rest I shall confine myself to saying,

"In apricum proferet ætas."

The next point of radical difference is, that the Irish Survey is carried on in a country within a few hours' steam of the most civilized nation of the world, between which packets daily ply; whilst the Indian Survey is carried on in a land little short of barbarous. It is no part, as I understand, of Colonel Colby's system to repair mathematical instruments; but that necessity has been forced on me, and I have trained an establishment of native artificers, who, if they proceed at their present rate of improvement for two years longer, bid fair to make us inde-

pendent of Europe, in all but glasses and levels. It is necessary to see the facts in order to believe them; and it would look like boasting if I were to describe the real state of things in this point. But as it will follow, on the introduction of the aërial wonder-working scheme, that either these elements must be swept away or retained, I have only to hope that your Royal Highness will show how reluctantly and unconsciously your concurrence has been so publicly given to this Address, by taking measures to prevent the merit of any part of my labours being appropriated by my successor.

There follows in order the immense distinction, that in Ireland, if I understand it rightly, all large instruments are carried on a march in spring carts, whilst those of all sorts and sizes of the Great Trigonometrical Survey of India are conveyed on the shoulders or heads of men. The carriers so employed cannot be procured at call: it would be the idlest speculation on earth to look for hired men in sufficient numbers in any part of India, equal to execute this office with safety—nay, equal to any other task, even that of transposing stones from one spot to another.

From these people are taken those who build our piles, pitch our tents, manage our heliotropes sight-vanes and lamps, cut our rays through forests and groves, dig our roads of ascent to hill stations, tend our instruments and their reading lamps, make our tapers, and perform in general all secondary offices, for which they receive each from five to nine rupees (ten to eighteen shillings) per month; and surely I need not inform the thirty-eight learned Fellows that these duties cannot be performed without some previous training. Yet how are the persons whom I have taken from the plough-tail and loom and other such primitive occupations, and succeeded in instructing and systematizing with so much painful toil, and after so many failures, to amalgamate with the wonder-working scheme? They must either be swept away also, or Major Jervis, when he succeeds to me, must avail himself of the elements of my machinery—a

result to which I can have no objection, provided the exact amount of my labours which he should thus appropriate, be duly acknowledged.

Most of the angles of principal triangles in the Great Trigonometrical Survey of India are observed by night, and by means of lamps which consist of a paraboloidal reflector of twelve inches diameter applied to an Argand's burner. The introduction of night lights into this department, as a general practice, is entirely due to me: in the time of my predecessor it was unknown, for though blue lights had been used in one or two instances by Colonel Lambton in years far back, yet I never saw it done under him, nor did any party, taking the field, ever go equipped for night observation.

The practice was first attempted in 1822-3 by myself, and since that time has been universal; the result of which is that the whole constitution of the departmental duties has been changed, and instead of taking the field at the commencement of the rainy season, and remaining under canvas during the whole of the most unhealthy period of the year, which was the ruinous usage, we bore a passage through the dense mists of other seasons, which, though less favourable, as far as the limpidness of the medium is concerned, make ample amends in their greater salubrity.

The lamps I speak of, with paraboloidal reflectors, were constructed to my order for the E. I. Company by Mr. Simms, in 1830; for the implements which I originally used were by far too rude, primitive, and wasteful of oil. But it is well known that an Argand's burner is unavailable in an agitated medium; wherefore, after many failures I have hit on the expedient of enclosing the whole in a wooden shed with a glass window, which serves as a packing case in travelling.

Now the means of centering and adjusting this shed, so that the axis of the emergent rays shall pass over the centre of the station, have all been supplied, and the remedy is so effectual, that in the heaviest storms of wind the light emitted is as bright at

thirty miles off as a star of the third magnitude; nor even from heavy showers of rain, provided the aperture or tin chimney at top be sheltered, need any interruption be apprehended.

This then, I submit to your Royal Highness, is another feature of the Great Trigonometrical Survey of India, of which, when I was in Ireland, I could find no traces in Colonel Colby's system; and if to ensure a conformity, which cannot otherwise exist, my lamps and system of observing terrestrial angles by night be to be swept off the boards at my departure, it will certainly not become me to repine over the return to the olden system because of its being a retrograde process; but at the same time, if, as I expect, Major Jervis should find it impossible to dispense with my apparatus and arrangements, I must protest against its being left to his option to do so, and arrogate any merit to himself for my improvements or any portion of them.

I never use masts or piles but for secondary stations. A sight-vane, of an isosceles-triangular form, eight feet high, perforated with an aperture of two inches diameter, which serves as a diaphragm for the rays of a heliotrope to pass through, is the only day-signal.

The top of the sight-vane is formed like the kalas or spire of a Hindu temple or Mohammedan mosque, and a plumb-line suspended therefrom, and passing through the centre of the two-inch aperture, furnishes the means of adjustment; in all which my Natives have been instructed, as well as in the management of the reverberatory lamps, which latter are put up at sunset, and taken down at sunrise to make room for the former.

Experience has taught me that the mode adopted in former years of building the platforms all of one body is objectionable; and though the old instruments were not sufficiently delicate to make this perceptible, yet those which have been constructed under my superintendence point to the absolute necessity, where extreme accuracy is sought, of separating the central pillar, by an annular space, from the part on which the observers tread,—another precaution which is now always attended to.

These are all, more or less, I apprehend, features which my department has not in common with Colonel Colby's system. It may be, certainly, that two persons whose minds are intently bent on the same pursuit have arrived at the same result in different ways; and as the question is not with Colonel Colby, but with the thirty-eight learned Fellows, I must disclaim all desire to interfere with any pretensions to which he may have a prior claim. But I must decidedly say that I noted nothing akin to them when I was in Ireland, and have never copied from his system in any respect, except, to use my former metaphor, that of giving a particular application to a general equation, founded on principles open to all mankind, with coefficients drawn from local causes.

Herein I have certainly sought to follow his example, for I have made it the rule of my whole life to cull excellencies wherever I chanced to meet them; and as it is impossible that, under the constant operation of this maxim, I could have associated for upwards of a month on terms of daily intimacy with gentlemen so able as Col. Colby and his Officers, without learning much, acquiring many new and valuable hints, and improving what my own experience had taught me—so, when my work comes to be given to the world, I shall not fail to make my acknowledgments in form for benefits so received.

> "For mine own part,
> I shall be glad to learn of noble men."

Ireland is a healthy congenial country, the land of hospitality to a proverb; and when sickness attacks parties engaged in surveying, it affects individuals only who may be easily removed to the shelter of some habitable and friendly roof not far distant. In India, ofttimes the jungle fever rises as by enchantment in a night, and sweeps over the camp like an avenging angel, laying prostrate beneath its fury every human being without distinction of complexion, country, or faith. What are the seventy Sappers and thirty Civilians to do under such an unsparing visitation; perhaps hundreds of miles from home, in a country where there

are no roads, no medical assistance at hand, no one to sympathise with their miseries, and amidst a population who deem their very touch impure and unholy? They must die by the road-side, as many of the Natives of the Great Trigonometrical Survey have done without my being able to help it; as I myself have often narrowly escaped doing; and their carcases will remain to rot and putrify, whilst the vultures crows and dogs fight in clamorous and discordant chorus for the choicest morsels of their booty. But I shall probably be consulted before this happens, provided I have not previously made way for my successor and his projects.

I have spoken hitherto of the seventy Sappers and thirty Civilians only; but in relation to the Officers, namely three Captains and five Subalterns, a few words may not be amiss. Those gentlemen will soon find out that the Great Trigonometrical Survey of Ireland and the Great Trigonometrical Survey of India are two distinct affairs, though the two names do both begin with an I; and that what they may have learned in the former will not apply without modification to the latter. They will soon compare notes with their brother Officers; and it will be manifest on a week's trial that only persons of a particular taste, combined with peculiar habits of endurance and suitability to an eastern climate, can accommodate themselves to the duties, privations, and modes of life, which are inseparable from the career marked out for them; wherefore, without meaning at all to damp their ardour, it would be but an act of common kindness to warn them of the expediency of not committing themselves by any irrevocable step.

That, however, is their own look out, not mine; but as it will be clearly seen that I look upon the whole project as fraught with the seeds of self-destruction and failure, it will be advisable to examine into another feature of discrepancy which Col. Colby's system presents, irreconcileable *in toto*, as I conceive, with the circumstances of India and with the plan developed in Major Jervis's pamphlet, which the thirty-eight learned Fellows have bound themselves *to make common cause* withal.

Though there are, doubtless, many talented Officers in India, yet the main impulse which prompts Englishmen to submit to expatriation to that alien clime is to seek wealth, that they may return with the means of sharing in its delights and comforts to their native land. Compared to this, science is, and most probably ever will be, a secondary consideration; and though there is no want of candidates to enact the primary parts of the drama, for which ample salaries are allowed, yet the subordinate parts are rarely sought for or occupied but as a temporary expedient; as a stepping-stone in fact whereon to poise one's self, or gain a vantage ground to collect strength for springing to some more profitable height.

The Honourable E. I. Company have three distinct armies, one at each of the Presidencies of Calcutta, Madras, and Bombay; and it needs but a slight examination of their army-list to show, that in each of the corps composing either of the three, the proportion which the number of European Officers holding commissions bears to the numerical strength or rank and file of each regiment, falls far below that of any European army whatever, whilst the portion of that portion absent on account of sickness or furlough is much greater. Yet from this comparatively small residue all military and staff situations are filled, the occupants being nevertheless borne on the effective strength of the regiments to which they belong as if actually present and doing regimental duty.

From this cause it is impossible for the Government to attend to scientific pursuits, *sine limite;* and even if the balance of the revenue, after payment of the expenses necessary to the tenure of the country, admitted of that procedure, gentlemen of the Council might probably think that there were objects of more vital importance to be provided for first, such as the more complete officering of their military corps; supplying the field batteries of artillery with horses instead of *oxen;* making roads of communication and canals for irrigation and internal traffic, and more effectual provision for the protection and accommodation of tra-

vellers; establishing a letter-post which should travel at a greater average rate *than four miles per hour;* together with many other matters of a like kind, very humdrum no doubt, but which some people have a peculiar propensity for attaching weight to, and amongst which we must not forget to include the education of the people.

Now though I have not a word to say in favour of those in high places, and their herd of followers, who openly avow a contempt for science and its votaries, and insist on the *primâ facie* profit and loss as the only criterion by which the ultimate utility of that or any thing else is to be tested, yet I am so simple as to think that it does not savour of sound judgment to quarrel with the conscientious views of others, who disinterestedly give the preference to improvements bearing more obviously and immediately on the actual wants of this country and its inhabitants; and again, as to the fact which I have above stated, of the reason which chiefly induces my countrymen to come to India at all, though I am not by any means prepared to enter into a laboured defence of a principle which is so totally at variance with what we are used to call the virtuous days of Rome, when Cincinnatus and Regulus tilled the ground one day and commanded an army the next, yet it must be remembered that the

> —— "Quid non mortalia pectora cogis
> Auri sacra fames,"

or, in other words, the doing any thing to get money, seems to have been one of the most indelibly-marked features of the human race since the earliest authentic records; and, in fact, in spite of all that philosophers may say to brand the habit with the terms "mercenary," "hireling," and "selfish," it will, I apprehend, generally be found that those who most advocate that extreme of purity and disregard of self-interest in the case of others, are not precisely the very people who practise their own virtuous doctrines the most.

In addition to what I have said respecting the Honourable

E. I. Company's armies at their three Presidencies, there are, as your Royal Highness is aware, several regiments of cavalry and infantry of the Royal Army, but none of Royal Artillery or Engineers; for which two last-mentioned services the Officers are educated at an academy near Croydon, at a place called Addiscombe, where a large and suitable establishment of Superintendents, Professors, Examiners, and so forth, analogous to those of Sandhurst and Woolwich, is maintained by the E. I. Company.

Now by existing usage the Officers of Her Majesty's corps so circumstanced are habitually excluded from all staff situations in India whatsoever, except those of Commander-in-Chief; commands of divisions and brigades, in which all are competent to share alike; and such as are purely military, and relate to their own internal economy: and though there are instances of exception in days gone by, and truly honourable ones, in support whereof I need but pronounce the names of Lambton, Warren, Kater, yet now so strict is the exclusion, that an Officer of Her Majesty's army serving in India, however high his talent and however palpable his fitness, could not overstep the boundary. It is yet to be shown, however, that the system of education pursued at the Royal Military College of Sandhurst, at which many of those Officers are brought up, is inferior to that of Addiscombe, and this more especially in pursuits like Geodesy in India, where activity of mind and body, hardihood, patience of toil, conciliatory deportment and inventive genius, are more needed than profound scientific lore, although even in the latter respect the pretensions of an institution that can boast of having in its day numbered the names of Ivory, Wallace, and Dalby amongst its Professors, should not be needlessly set aside.

The Officers of the Honourable Company's army in India may however be considered as having succeeded in securing this field entirely to themselves; and without stopping to consider whether this be right or wrong, it will illustrate the subject to examine the ingredients of which that body is composed, and their applicability to the objects enumerated in the Address of the thirty-eight

learned Fellows; in order to which, it is proper to begin with the Engineer corps of the three Presidencies, as those denominated scientific *par excellence*.

A certain number of youths between the ages of fourteen and eighteen are annually nominated by the gentlemen of the Direction for their army, as Cadets; of which number, according to the state of existing vacancies, a portion, selected by no other standard than that of patronage, is sent to Addiscombe to be educated; another portion similarly chosen is destined to the Cavalry regiments; and the remainder is appointed to the Infantry.

The great prize held out to stimulate the exertions of the students at Addiscombe is to get into the Engineer corps, because the number of lucrative situations in India to which the Officers of those corps are exclusively eligible, and wherein the remuneration is more than proportionate to the exertion called for, surpasses nearly tenfold that of the advantages within reach of the rest of the army.

A public examination takes place half-yearly at Addiscombe, and the spectacle, like all its kindred, is sufficiently interesting. It is amusing to see the young aspiring stripling go away, bending, as it were, underneath the load of prizes awarded; but we must be careful not to confound two things utterly distinct. The distribution of those prizes, following so immediately on the examination, leads the spectator to consider the two in the light of antecedent and consequent, as the prizes were decreed to the victor at the Olympic games, or at a tournament. But it is not so: the prizes depend on the standing on the half-yearly list, and have no reference to the result of that public display. The event once over, each élève may or may not throw aside for ever and anon all the burdensome harness and trappings which he has borne to suit his purpose: they are no longer indispensable elements to the prosperity of his career; and unless the successful candidate have a sincere attachment to scientific pursuits, it is most probable he will follow the former course—a result which generally ensues.

In order to estimate the relative amount of the qualifications of those élèves who are nominated to the Engineer corps, it is necessary to examine into the method of making the final selections, which, as I understand, is as follows: At the time of each half-yearly examination, it has been decided beforehand, in Leadenhall-street, by a reference to the returns from India, what number of Cadets shall be taken from the Institution, and how they shall be distributed. The reports of qualifications made by the Professors are then laid on the table before the Court, and those who head the list are taken for the Engineers, the next portion for the Artillery, and the remainder for the Infantry.

Nothing can apparently be fairer than this; but there is one result deserving notice, which I will endeavour to elucidate. Let n be the number of Cadets required for the Engineer corps, m for the Artillery at any half yearly period A; $n_{(1)}$, $m_{(1)}$, the like quantities at another such period $A_{(1)}$; P, $P_{(1)}$ two individuals who have both *crammed quantum suff.* of lore to pass the prescribed examination, but of whom $P_{(1)}$ is as remarkable for natural genius and intelligence as P is for the absence of those qualities. Now it may happen that because $n > n_{(1)}$, P will succeed in getting into the Engineers at the period A, and $P_{(1)}$ fail at the period $A_{(1)}$, and moreover if the standing which $P_{(1)}$ happens to have on the list of eligibles at the period $A_{(1)}$, be less than $n_{(1)}+m_{(1)}$, which may have arisen from the more than ordinary celerity of his progress bringing him within the vortex, he will, in spite of his superiority, be put into the Artillery list, with which, when once entered, he must abide to the end of his career. This is a case of which I am assured there are many instances; and my experience goes to prove that it is so, whence it follows as a necessary consequence, that ofttimes very stupid people are found in the Engineers, and very clever people in the Artillery.

It is also to be remarked, that the instruction at Addiscombe is purely elementary, and, as far as Geodesy is concerned, in no wise practical; as also that Cadets of the Infantry and Cavalry

who do not pass through that institution, are sometimes better instructed in this branch of science than those who do,—a fact which will appear the less difficult to conceive when I mention that amongst the former are sometimes found persons who have passed through Sandhurst or Woolwich; whilst it is a well-known truth that many of those whose intellects do not develope themselves at the early age of fourteen to eighteen, evince at a later period far more capability than those who are more precocious.

From these causes the consequence naturally flows that the Engineer corps in India are peculiarly remarkable for being divided into two distinct classes,—those who sustain the character of the corps, and those who lean on the corps for a character; and it is the result almost inevitable of the prevailing system, that there are many Officers of eminent talent and attainment in the mass, who would hold a distinguished place in the public estimation of any country, as also a respectable proportion of quiet well-educated gentlemen who combine to constitute the former class; whilst of the latter the less that is said the better, because it is solely the injudicious attempt to clothe them in the mantle of preeminence and exclusive right which could have authorized my intruding an allusion to them.

Of the applicability of this latter class to the promotion of the objects enumerated in the Address of the thirty-eight learned Fellows, it would seem to me unnecessary to take up your Royal Highness's time by speaking further; wherefore the only elements which I shall consider effective are those who support the character of the corps. But high talent will not long consent to act a subordinate part where it can fill a principal one; and as there is a vast field of employment in a country like India, which, as I have before remarked, is in a state of rapid transition, there is no hope for the active and continued co-operation of the first-rate men to the attainment of those ends, otherwise than as amateurs, because they have higher prospects to direct their attention to.

Young men, when they originally come to India in the Engineer corps, have a wide range before them. The building department is theirs, to the almost entire exclusion of every body else; they are eligible to the survey department in common with all their brother Officers of the army; they may, if they have interest with the head of the Government, obtain employment in the diplomatic line; and there is no law to prevent their rising to the highest offices of the state, whether military or political.

With these prospects it is not matter for marvel that few should direct their attention to the Great Trigonometrical Survey, because it is really *one of the hardest modes of life in any part of the world;* the *worst relatively paid;* and therefore the least recommendable by the dictates of that sound philosophy which teaches us to seek happiness as the main end of existence.

Hence is derived an easy solution of the difficulty why, considering the advantages given by the Institution at Addiscombe, so few Officers of Engineers have ever been distinguished or even employed in the survey department; for the answer is this,—few people have an inclination to martyrise themselves and their interests in the cause of science; and as those who read their Bibles may have learned from the Preacher, that *better is an handful with quietness, than both hands full with travail and vexation of spirit*, so, if we transpose the singular and plural terms, *à fortiori*, the dictate of wisdom applies to regulate our actions, whence it happens that of the whole body but a very limited number is available, and of that number only a small portion can be spared from the other duties for which they are required.

Hence too is apparent the inexpediency of any measure whatever tending to contract resources already confined within limits too strict to meet the occasion; and hence we see the impolicy of the thirty-eight learned Fellows combining to pledge themselves to *make common cause* with a schemer who avowedly proposes to introduce Col. Colby's system into operation in India, unmodified to meet the new conditions of locality; for that system has for

one of its most distinctive features, to employ Officers of the Engineers, and of the Engineers only; and by a parity of reasoning would, in its application to India, go to create a close, invidious, and hitherto unknown monopoly in favour of a particular branch of the E. I. Company's army, to the overthrow of the more enlarged principle which has left scope for a Lambton, a Kater, a Warren, and many others, myself included, not one of whom could have ever come forward to notice, if the theory now advocated and sought to be established had been in force at the commencement of our careers.

I must contend that it is the palpable aim of that pamphlet throughout to close the door of entrance to all but those bearing the designation of Engineer Officers, who, but for the utter impossibility of the plan succeeding, would have matters all their own way. But there is still an under-current to which I wish to draw the attention of your Royal Highness. The writer is manifestly alive to the fact, that the establishment of Engineers is, as I have pointed out, numerically insufficient for the new demand that his plan would make; wherefore he sagely enough proposes that the strength of the establishment should be increased. Now, as promotion is by seniority in all corps of the E. I. Company's army, the effects of such an increase on the identical prospects of the mover of this scheme are too evident to need that I should waste time in unveiling the ingenuity and cleverness of the manœuvre: and thus, by a dexterity and adroitness worthy of a better fate than this exposure of its nakedness, thirty-eight learned Fellows, some of them most celebrated of their day for their scientific attainments, have actually been drawn into lending the sanction of their names and influence to the introduction of a measure calculated to serve no other end than that of accelerating the promotion of Major Jervis to the rank of Lieut.-Col., whilst it would inflict the severest injury on the cause of science, by effectually excluding, even from the vestibule, all other votaries than the would-be self-elected ministering priests of the temple.

My career in India and connexion with the E. I. Company are so near their termination that I am not personally interested in this question, which cannot affect me in whatever way it is decided; but as it is not natural that I should have been so long allied to my present department without feeling some regard more or less for those who have given me so much satisfaction, I will briefly explain to your Royal Highness the principles of the comprehensive scheme which it has been my unceasing effort to introduce.

First: A clear and free road open to competitors of all kinds, and no favour.

Second: Let talents and fitness form the sole standard by which candidates are to be judged.

Third: Whenever a person is found who possesses these requisites undeniably, let no man have the right to gainsay his entrance into the survey department, or inquire whether he belong to this or that branch of the E. I. Company's or Her Majesty's army.

When, in 1817, I was originally nominated as first assistant to Lieut.-Col. Lambton, no Engineer Officer stood forward to compete with me; Capt. Garling, of the Madras Infantry, was my only rival.

When, in 1823, at the death of Lieut.-Col. Lambton, the situation of Superintendent of the Great Trigonometrical Survey of India fell vacant, no claimant of any sort appeared to contest with me.

When, in 1825, I was about to quit India and return to England; when in fact most men looked upon the close not only of my connexion with the Great Trigonometrical Survey, but of my earthly career, as inevitable and at hand,—the Government of Bengal, in resolving to keep the situation open during my absence on sick leave, were not actuated by private regard or affection to me, for I had no interest with my Lord Amherst, and had never acquired the art of paying my court to the great, or gaining their favour by other means than deserving it.

It was the difficulty of finding a competent successor that induced the step; and if a suitable person could have been met with, he would have been put in nomination immediately. Why did not Major Jervis step forward then, and offer himself as willing to enter the arena, and grapple with a task which had well nigh put an end to me? He would have been accepted if he could have established his fitness; and the fair presumption, from his shrinking from so fair an occasion, is that *he distrusted the powers of which he now so unsparingly vaunts.*

Again, in 1828, when the local Government of Bombay and that of Calcutta coincided in the propriety of forming an establishment for carrying on a series of principal triangles to connect with mine of 1822-3, intended to unite Bombay with the Great Arc of India, they sought in vain for a qualified Officer of Engineers. Major Jopp of the Bombay Engineers was then looked up to as the ablest and most promising Officer of that branch of the Military Establishment on that side of the Peninsula; but though he was actually in the survey department, yet his pretensions were set aside as inferior to those of Captain Shortrede, an Officer of Infantry; and at a subsequent period, 1833, Major Jopp himself publicly avowed in an official letter now amongst my records his inability to prosecute trigonometrical operations on the great scale.

Here was another opportunity for Major Jervis to step forward, offer himself as a candidate, and show what he could do; yet there is no record of his having availed himself of this or any other during my administration or that of my precursor in office; though I have, in conformity with the principles detailed above, been constantly on the search for men of talent and suitable persons, and should have eagerly coveted the occasion to bring them forward.

In fact, please your Royal Highness, before this pamphlet was ushered into birth, Major Jervis's name was unknown on this side of India except in my office, and then only in connexion with one of the many minor surveys in progress, under the general

superintendence of the Surveyor-General of India, amongst which it ranked but as a second or third-rate performance; and the astonishment of all men at seeing a production of the kind coming forth backed by the Address of the thirty-eight learned Fellows protesting and vowing that they would *make common cause with the proposer*, may be better imagined than described.

I submit, therefore, to your Royal Highness, that considering the entire contrast presented by the local features and circumstances under which the Great Trigonometrical Survey of Ireland operates, when compared with those under which that of India must be carried on, Major Jervis would have better promoted the interest of science and his employers by coming out to India, and there making himself acquainted with the working of my system, of which it is clear that he as yet knows nothing, and has every thing to learn. He need not deem it subject of mortification, or derogatory to his dignity, to put himself under the tuition of an Officer of Artillery, for there is example for it, Col. Colby having done as much during the lifetime of the late Gen. Mudge; and unless the complimentary terms in which he speaks of us both be mere unmeaning words, (which it is to be hoped is not the case,) he may look on this as the fairest prospect of becoming efficient in the actual field of his labours in the shortest time, with the additional advantage of being able to experiment practically on his theories, without fear of committing irreparable injury.

Amidst so many candidates for the situation of Surveyor-General of India, which I am so anxious to vacate, Major Jervis ought to consider himself a very fortunate person in having been selected by the Court of Directors; and I hope one of the lessons he will learn from Col. Colby will be to eschew putting in print, and making exposures to the public gaze of, letters to his employers, bearing on points in which he happens to differ from them. I do not observe that this is the practice of the Officers of the Great Trigonometrical Survey of Ireland; nor did I ever remark when in Ireland any thing which warranted the conclu-

sion that such a paragraph as that under-mentioned could ever have emanated from a responsible member of that department.

" In appointing me to this arduous and responsible office, the Honourable Court may rest satisfied they have made no injudicious choice. I ask their confidence therefore with all frankness, as a tried and upright public servant, who has no private ends, nor prejudices of any sort to affect or warp his understanding."—P. 4, letter dated August 6, 1838.

Certainly we carry on things differently here, and one of our maxims is, that " *he who desires willing obedience from those under his authority, must set them the example by a cheerful and respectful acquiescence in the behests of his superiors in authority.*"

Amidst the divers letters bound up with Major Jervis's pamphlet, some proving nothing, and others but little more, to the immediate purpose of India, it is, I submit to your Royal Highness, to be regretted, that a letter which Col. Pasley seems to have written should have been omitted. From the high character of that gentleman, and from the well-known station which he holds in public estimation as a practical man, it might in reason have been expected, that he would in such a question as this have been one of the first consulted. There is reason to suppose that he was consulted, and that his opinion was set aside,—a conclusion which gains force from the circumstance, that his name occupies not a place amongst the thirty-eight learned Fellows. In my next letter I will take leave to examine into that question.

I have the honour to be, &c. &c.

George Everest.

LETTER IX.

"Nullum numen habes si sit Prudentia: sed te
Nos facimus, Fortuna, Deam, cæloque locamus."

MAY IT PLEASE YOUR ROYAL HIGHNESS,

In my last letter I proposed to examine into the question of the omission of Colonel Pasley's letter, to which a reference is made in the following paragraph of Major Jervis's letter to the Court of Directors, dated 6th August:

"I annex their answers for the Honourable Court's information, and content myself with submitting what I represented to Colonel Pasley when at Chatham—that the entire responsibility of the Survey, more especially if conducted on this novel principle, would rest exclusively with me—that my reputation and judgment were staked upon its issue, both in a financial and public point of view; that any measure, therefore, which I suggested for the promotion of such undertaking, ought not to be considered as any disparagement of his admirable system of instruction; nor could I see what useful purpose or ultimate benefit could be gained by his advising the contrary, and thus at the outset thwarting those measures I had contended for, and debarring me from that confidence which is so generally and particularly advocated."

Now before entering into an immediate examination of the particular bearing of this paragraph, it may be, I presume, allowed me to compare the pretensions of the two parties thus brought before the public, namely, the gentleman who writes,

and him to whom the paragraph applies; and as, after what I have said of the former in my last letter, it will be needless to say more, it only remains to the completion of the contrast, that an adequate analysis should be entered into in reference to the latter—a task which I sincerely wish had fallen into abler hands than mine, for I freely confess my inability to do justice to it, and must beg Colonel Pasley, to the honour of whose acquaintance I may barely aspire, to pardon at the same time the lameness of my attempt, and the liberty which I take in so freely using his name without asking his consent.

Your Royal Highness will recollect the state of public feeling in 1808-9, when, bowed down under the weight of accumulated disasters and failures, a general despondency, not far removed from that which historians describe to have taken possession of old Rome after the battle of Cannæ, seemed to pervade our native land. Wellington had not then taught us how to chain victory to our chariot. People in general seemed to have yielded to sullen conviction, that though our forefathers had taught us to believe that one Englishman was always a match for three Frenchmen, yet there was now no longer a foundation for such an aphorism, even though for three we should substitute one. Even in our House of Commons there were not wanting orators who proclaimed that, in as far as land operations were concerned, the sun of British glory had for ever set; and the persuasion seemed daily and hourly gaining strength in the minds of all men, that though on the sea, which was the natural element of Englishmen, we were indisputably masters, yet as a military nation our land forces could never hold aught but a secondary or tertiary rank.

If there be any who doubt the fact of what I here aver, I must refer them to the writings of Mr. Cobbett of that period; but I need not refer your Royal Highness to that source, because your own recollections of those bygone days are doubtless as strong as mine are; and I presume it is barely necessary to establish the fact, in order to establish the conclusion also, that

if such an impression had continued to gain ground uninterruptedly, the result could have been no other than a disgraceful peace, humbling Great Britain to the dust, and placing her at the tender mercy of the triumphant Napoleon, arrayed in the spoils and glittering in the untarnished glory of the vanquished world.

What saith the proverb? "A friend in need is a friend indeed." In that critical time came forth a work entitled, "The Military Policy of Great Britain," which, like the glimmer of daylight peering through the vista of a tortuous cavern, showed that the dark passage was not interminable. The effect was like that of enchantment: the magical spell was broken by the wand of the good genius; the film seemed to be suddenly removed from men's eyes, and henceforward they bound round them anew the girdle of resolution and constancy, preparatory to the death struggle, which was to end only with the confusion of our enemies.

Have we forgotten all these things, your Royal Highness? Have we forgotten that this valuable national work was written by Colonel Pasley? It may be so: and yet I am so simple as to imagine that there were periods since Noah's time when to such men statues would have been erected, and divine honours paid. I at least must beg to be excluded, right or wrong, from the number of the forgetful, for I was then in the heyday of youth, and the circumstances I speak of made a deep impression on me; then indeed I groaned, and doubly groaned, to think that my lot was cast in inglorious India.

It is possible that though the witty Author of the "Sayings and Doings" may have taught the English public to believe that there is nothing in India worth noticing but the absurdities and eccentricities of our countrymen in that funny land, yet some even of the thirty-eight learned Fellows may know there is a fortified town named Bhurtpore or Bhartpur, in lat. 27° 14′, and long. 77° 32′. I do at least, for it is but a few miles from my principal station of the Great Arc Series called Madhoni, which commands a fine view of its citadel; and to this said

Bhartpur siege was laid by Lord Lake in vain in the early part of this century.

There were, on the occasion I speak of, no less than four successive storming parties ordered out against Bhartpur, all and each of which failed in turn; and the little historical account extant leads to the supposition that at the first of these, but for a mistake in the routes of the different columns, the fortress would have had British colours flying on its walls, without the necessity of further strife, since most of the defenders of the breach had actually scampered away.

Such was the influence of the long course of victories of Lord Lake: but when the first assault had ended in failure, the effect upon a race peculiarly addicted to fatalism may be easily conceived; and hence each resistance exceeded in obstinacy that which had preceded it, until at last it seemed as hopeless a case for the English army to obtain possession of Bhartpur, as it had been for their enemies to force a passage into Gibraltar, and the long siege was terminated by an inglorious and humiliating treaty.

Bhartpur was now looked up to as the national champion, the great stronghold of Indian valour. It was perpetually held up and appealed to as a proof that the English career of conquest was not so irresistible or interminable as had heretofore been supposed; and henceforth every holder of a small mud fort, who had any pretension to pluck, seemed to think himself bound in honour to try a fall with the E. I. Company.

Let us look at such places as Komona; what are they? A miserable mud wall with a ditch before it, and flanked by round towers such as used to be the order of the day before the introduction of gunpowder, constitute the chief defence: but then these were sufficient for men determined to fight stoutly, against those who did not know how to equalize the vantage ground.

Even so late as 1817, when the fortress of Hatras succumbed, it is generally believed (though such matters are not publicly

announced) that though there was sufficient provocation for the measure, the gentlemen of the Council of Calcutta feared to undertake the siege, lest it should bring on a general war; and their consent was at last only obtained by the assurance of the Marquis of Hastings, that he would answer for the place being theirs in a stipulated period (ten days, if I rightly remember, from the time of breaking ground).

The Marquis's word was in the result made good; but the effect was brought to pass by a train of mortars and rockets (immensely numerous for those days) which kept the besieged perpetually on the *qui vive*, and ultimately blew up the powder magazine, so that the place was literally too hot to hold the garrison; and the Chieftain Daiaram, with fifty of his followers, clad in chain armour and laden with jewels and other valuables of easy transport, cut their passage through the besieging troops in the dead of night.

Hatras was a fort of small area, and just the sort of place where a hot bombardment is most likely to be successful. The English force does not appear to have stormed it: if the attempt had been made, there is no saying but it might have proved a second edition of Lord Lake's affair at Bhartpur; and moreover, as there was room for an improvement in the mode of defence, such a disaster as that of the explosion of the principal powder magazine need not be looked for in future, or calculated on as an every-day occurrence. This result therefore decided nothing, and proved nothing, for Bhartpur covers a very large area; and how often in face of the fall of Hatras, whilst engaged in the dominions of the Nizam in the operations of the Great Trigonometrical Survey, have I in conversation with natives been doomed to hear a speech, not intended to be particularly uncivil, terminated with such expressions as *the English never can take Bhartpur, it is too strong for them;* yet these declaimers and asserters were not aware that the ground which formed the basis of their impressions was gradually crumbling away beneath their feet, and that the time was

to come, and not far distant, when, by a process as irresistible as certain, the strongest fortress with a mud rampart must yield, and afford a practicable passage to British troops to fight hand to hand on equal ground with the besieged.

I need not take up further time with narrating particulars of sieges, which would be foreign to my purpose—for there are multitudes of others far more able to deal with such a subject than I am; but I believe there are few who will dispute the point with me, that it is to Col. Pasley and his admirable system of arrangements and instructions, that we owe not only the process of which I here speak, but the present efficiency and respectability of our military Engineers. We hear no longer of futile attempts to blow open gates; of mutual recriminations between those who storm breaches and those who construct batteries: no reproach is now vented on the latter for precipitancy in reporting the entrance practicable, when it was not so in reality; nor is blame imputed to the former for not achieving impossibilities. All seem to proceed about their business in the fullest harmony and confidence, each on the skill and courage of the other.

And what is the result of this, please your Royal Highness? Have we not within this last month seen an army of 35,000 Sindis and Belochis which covered Hyderabad and Bakkur, after threatening to eat the English army of the Indus, quietly accede to all our terms without striking a blow? The prestige of the national invincibility has recovered from the blow which it received at Bhartpur; and now, if it be still coupled in native imagination with the decrees of a capricious destiny, yet is it generally acknowledged by them to be irresistibly and irretrievably linked with Fate itself.

There can, I submit, be but one point in all this which is open to question, namely, how far I am entitled to conclude that Col. Pasley has been the Prospero whose wand has worked this change; and though I have never yet heard this fact doubted, yet it would not be consistent with sound logic to assume that it admits of no dispute. Granting, however, my premises, what

must we think of the paragraph which I have above cited, wherein an English Officer, the most remarkable in his day for his practical arrangements, the soundness and clearness of his judgment, and the service he has rendered to his country, both at home and in her colonies, is told almost in so many words to keep his advice to himself?

That India would owe Col. Pasley much more than she can ever repay, in the event of my view being correct, is quite plain; and it might be well worth the while of gentlemen who so liberally combine to raise statues and testimonials in cases of at least dubious import, to consider whether their spare cash might not be more respectably expended in rendering like offices of homage to merit which, granting my premises, would stand so proudly preeminent. That is, however, another question; but how Major Jervis, who has had the honour of being instructed under this pride of our country, could, after inditing such a paragraph, consent so far to forget what is due to himself, his profession, and his brother Officers, as to allow it to be proclaimed to the world that he is in his capacity, as provisional successor to the Surveyor-General of India, about to undergo a course of advice and aid from the learned quartetto enumerated in the Address, is, to my poor comprehension, quite irreconcileable.

Granting those gentlemen to be each and all a modern miracle of originality and acquirement; supposing that they all knew individually more than ever man knew before of modern analysis, and that it was not Newton who was required to discover the law of gravity, not Clairaut first to investigate the ellipsoid of variable density, but that the component elements of this quartetto would have been quite equal to lead in these untrodden paths if they had not been anticipated,—

All these points, though they certainly make a great call on my acquiescence, I am willing to concede. Still in a case purely practical there is nothing to set the validity of Col. Pasley's opinion aside; nothing, in my opinion, to warrant a gentleman holding the commission of Major humbling himself in the dust before them.

I judge, from the few rays which break through the smoky medium interposed between Col. Pasley's decision and the reader's gaze, that there must have been something in it akin to my own opinions. I fancy him telling the Court and Major Jervis that the instruction which he could impart was not likely to be applicable to the purposes of a Topographical Survey in India; and reminding the latter gentleman that he who in a complicated undertaking desires to have an efficient and obedient establishment subordinate to him, must be himself the instructor, the leader, and the companion of their labours, and make himself the patriarch and founder of his own system.

Though it would be an unnecessary expenditure of time to follow Major Jervis through all the ramblings of his pamphlet, in order to prove how utterly erroneous it is, and how thoroughly he is liable to mislead his readers, yet it may be as well to cite a few instances in point which, upon the principle of *ex uno disce omnes*, will serve as a guide.

In pp. 6, 7 of the letter to the Court, dated 6th August, Major Jervis states as follows:

"Every attempt at forming such establishments by individual Officers has invariably terminated in disappointment; their physical strength, their very lives are unequal to such an attempt: Col. Valentine Blacker and Col. Mackenzie fell a sacrifice to such endeavours; and Col. Everest has lately declared the futility of training any persons *at a reasonable charge*, or with any prospect of advantage, so long as there are any divided interests to thwart such measures."

In reference to which my counter-statement is as follows:

First: Col. Mackenzie died from pure old age, having lived (so at least we all considered who knew him) to the full period allotted by nature to man: for at least three years prior to his death, I can vouch for the fact, and I am inclined to believe a much longer period, that he had no more to do with forming and training establishments than your Royal Highness's august self.

Second: Col. Valentine Blacker fell a victim to fever contracted, as was supposed, from the noisome vapours generated by the cleaning of an old tank in the grounds attached to the Surveyor-General's Office, in Park-street, Chaoringi. He had no more to do with training and forming establishments than Col. Mackenzie had; and neither of these two gentlemen, after entering on their situation as Surveyor-General, ever left Calcutta, or took the field, or was under canvas, or suffered exposure to the climate: they were both stationary in a substantial house at the Presidency, and were quite free from all connexion with the Great Trigonometrical Survey—the life led in which is in truth an approximation to that of the Bohemian or Gipsy.

Third: My own objections are nothing to the purpose, and as they are in keeping with all that I have advanced in this correspondence, if there be any points in which I desire amelioration, I think the best way to ensure success is, after stating *pros* and *cons*, to leave them to the mature consideration of the Court, who, though they may have learned caution in taking any decisive step, are in the end sufficiently desirous to do what is right.

I have the honour to be, &c. &c.

George Everest.

LETTER X.

"Who proudly seized of learning's throne,
Now damns all learning but his own."

CHURCHILL'S "GHOST."

MAY IT PLEASE YOUR ROYAL HIGHNESS,

AMONGST the thirty-eight learned Fellows whose signatures are appended to the Address, I note the name of Sir John Herschell; and as the learned Baronet has not only made himself conspicuous as one of the Quartetto of proposed tutelage, but has also come more prominently forward than any other party in the body of the Address itself, I deem it but proper to devote this my last letter chiefly to his service.

The name of Herschell is a great name,—long dear to science and our country:—in my infancy it was lisped by children in their nursery; and it is always cheering to see such a name perpetuated from sire to son.

Men of science particularly hailed the early promise of the present bearer of that name with delight, and with less of envy than generally attends the admission of a new aspirant to their ranks; and as the learned Baronet was already acknowledged as one of the most erudite men of his day, if not the very chief of the scientific clan, it is not to be wondered at that, on my return to England in 1826, I, who had passed so many years of my life in jungles and wildernesses, far from the haunts of civilization, should have looked up to such a person with admiration, and all but reverence.

With such sentiments I eagerly sought the acquaintance of the learned Baronet; and as I could not suppose that the great national work in which I had succeeded to Lieut.-Col. Lambton would be either unknown or uninteresting to him, or even that there was any portion of that work, except what concerned the practical details of its application to the local circumstances of India, on which he would not be infinitely better calculated to instruct than learn from me, therefore in these latter respects, and indeed in all others, I was perpetually prepared to enter into a discussion, and should have been proud to afford the man who ranked so high in my esteem all the information he might desire to seek, or that it was in my power to offer. But though I met Sir John Herschell in private and in public on many occasions both before and after my return from the Continent, I cannot remember that he ever evinced the slightest interest in the operations of the Great Trigonometrical Survey of India, or expressed the most distant wish for any information regarding it; and as I at least, having been sufficiently warned by Mr. Theodore Hooke (many thanks to his high wittiness!) to steer clear of the ridiculous, was sensibly alive to the absurdity of volunteering what was not sought, and therefore not wanted, I naturally enough arrived at the conclusion, which I shall now find some difficulty in relinquishing, that at the period I speak of neither Geodesy, in its bearing on the figure of the Earth, nor Geography, nor Topography, nor any of the subjects now so clamoured about, were subjects which had entered into the learned Baronet's studies, or which he deemed deserving of his notice.

The advent of the learned Baronet into our demesnes might, therefore, now be hailed as a happy event; and I should be the first to take off my hat and bid him welcome, as indeed I was prepared to do at my mountain home in Hatipaon, when rumour spread abroad that he was about to honour India with a visit; but there are certain forms prescribed by convention, which no person, however great may be his learning, his rank,

his wealth, or however excellent the name he bears, is authorised to neglect; and these, I contend that in the present instance, Sir John Herschell has totally overlooked, even if it be not imputable to him that he has intentionally violated them.

We will proceed to particulars presently, but first it is necessary that I should explain what I mean by these forms of convention; to the understanding of which I must remark, that when a certain class of persons is engaged in any occupation whatever, and a stranger desires to enter amongst them, it is incumbent on them before proceeding to dictate, to ascertain what has already been accomplished, and how; for he who, without taking such a precaution, begins with laying down the law and issuing directions, is not only very apt to call for that to be done which has been satisfactorily completed before his entrance, but is likely to give great and uncalled-for offence.

But now to show that the learned Baronet has acted in this wise, I will take the liberty of citing his own words, as delivered to the world in the printed copy of the Address to the Court of Directors, signed by the thirty-eight learned Fellows, which are as follow:

Sir John Herschell recommends, "that no pains or expense should be spared in procuring as perfect a unit of measure as possible, comparable with the British measures: that is, in obtaining a *fac-simile* of the standard of the Royal Astronomical Society, and comparing it, when in India, with all Lambton's and Everest's units, by which the value of the Indian arc will become known in recognized units."

Sir John Herschell recommends, "that the standard used by Lambton and Everest should hereafter, at some convenient opportunity, be sent to London for verification;" and further advises, if it has not already been done, "that an arc of longitude, comparable in extent to Lambton's meridional arc, should be measured trigonometrically, and the difference in longitude between the extremities ascertained by a chain or chains of rocket signals, and their latitudes per sector."

He further recommends, " that the utmost possible care should be taken to fix the zero errors of division of all the thermometers used in every part of the process under Major Jervis's direction, as much inconvenience and mischief has resulted and daily results from neglect of this precaution." Sir John Herschell refers to Colonel Colby as the best authority with whom to communicate.

Now I submit to your Royal Highness, that except in the one point of an arc of longitude, wherein the learned Baronet speaks doubtingly, there is a general tone of absolute assumption throughout, that the E. I. Company and their agent have omitted each and all of the precautions enumerated; that such is the impression calculated to be conveyed; and that no other conclusion can be come to by those who read the learned Baronet's dictum. It will be soon seen how far that is fact, and how far the imputation is merited; but in order to make that clear, I must anticipate on my work now in preparation, which I really think is what the learned Baronet can have no right to expect.

I should prefer that, however, to repeating my own words, for that would be exceedingly wearisome, and if my book printed in 1830 be not deserving of Sir John Herschell's notice, would be time thrown away; for what hope could I have that what passed unheeded then would now meet with more attention ?

If the learned Baronet do not conceive it too great an act of condescension to refer to that book, pp. 50, 51, 52, he will find that for many years the only standard used by Colonel Lambton was a standard chain, set off by Ramsden from his bar, at the temperature of 50° Fahrenheit; that in the course of the operations the joints of this standard had become oxidated, and that in cleaning them the length became altered, subsequent whereto it could no longer be relied on as an invariable standard.

To my poor comprehension it seems, that the unit of measure in all operations prior to this, namely, those ending with the Gooty base, was irretrievably lost; however, there is no saying what expedients genius may devise, because that would be tantamount

to proving a negative; but in the present case, as it is confessedly beyond my skill to devise any remedy, save that of assuming the perfect accordance with Ramsden's bar, I shall be happy to receive any suggestions from the learned Quartetto, who in that point shall find me quite as placid and docile as they assume Major Jervis to be; and I will then venture to hint at an extension of the principle, by restoring the identical Parliamentary standard, though it was burned in the conflagration of the Houses.

After the disaster of the rust and consequent cleaning, Colonel Lambton struck out a method of comparing the chain with our three feet standard scale of brass, by Cary; but the experiments were always very wild, and in my opinion, as I give the readers of that book to understand, never proved any thing. It is necessary to see the method tried—it is necessary to see the whole results, as they stand registered in the old books of the day, to judge of the accuracy of this opinion: I have done so, and satisfied myself; but in the present instance, the only method that appears feasible to me is, to take the results, either published or in manuscript, as far as Colonel Lambton's part of the arc is concerned, and those published in my book, pp. 121 to 124, as far as mine are in question.

The former will be found in the manuscript copy of the volume of the General Report which I forwarded to the India House from Calcutta, in 1832: as to the latter, though in 1824-5 I followed precisely in the steps of my predecessor, because I could not at the time devise a better method, yet I have since taken the only feasible mode of applying a remedy, by re-measuring the Sironj base with the compensation bars, and intend to treat the Beder base in like manner, which is one of the reasons of my present detention in India.

Thus the arc between Sironj, in latitude 24° 7′, and Dehra Dún, in latitude 30° 15′, already stands quite independent of the former unit, as also does the longitudinal series originating from the Sironj base, and terminated by the Calcutta base; and if I

live to fulfil my intentions above alluded to, the arc between Beder and Sironj will be in a like predicament, whereby all work executed by me or under my orders will stand entirely free from the doubtful unit of former days. The work to the south of Beder, and between it and Cape Comorin, was all performed by Colonel Lambton before I joined the department in 1818, and I am in no wise concerned in it: it may be rendered independent of the rusty accident, by considering the line divided into two sections, one beginning at Beder and terminating at Dodagoonta, the other beginning at Dodagoonta and ending at Pallamcotta, for the latest of these bases is dated 1809, or about four years prior to the occurrence; but then Ramsden's bar must be referred to, and Ramsden's accuracy taken as infallible. Moreover, there is another source of embarrassment. I have caused the whole of the angles of principal triangles between Beder and Sironj to be remeasured with the instruments which I brought out with me to India, because the others were not so accurate as I liked; and it appears that every vestige of Colonel Lambton's Beder base has been erased by the wilful inhabitants, so that the old and new units will still conflict; and though genius may, for aught I can say, devise some wonder-working method to meet the occasion, yet it surpasses me to think of any other mode of reconciling the incongruity, than the simple one of measuring the Dodagoonta and Pallamcotta bases over again with compensation bars.

This I decidedly have no intention of doing. I have long been convinced of how ill personal sacrifices are appreciated, and I make no more; therefore in the course of instructions to which the learned Quartetto subject Major Jervis, I beg to point out as one item the necessity of learning how to measure base lines with compensation bars, and how to practise that operation in India.

That part of the subject relating to the old unit may now, I presume, be considered as disposed of; and it will be clearly seen that I intend to extricate all operations with which I am in

any wise concerned from connexion with that dubious element, and how; we may therefore proceed, without apprehension of confusion, to the unit of reference introduced since 1830.

Compensation-bars and microscopes are, as is well known, the invention of Colonel Colby. I learned the use of them from my friends Captain Drummond and the late Captain Murphy, of the Royal Engineers, to whose kindness I am more indebted than I can express for the very obliging manner in which they came to assist me through my difficulties, and point out the details of the operation, when I was engaged in trying those made for the E. I. Company, in Lord's Cricket Ground, St. John's Wood Road.

This apparatus, then of but recent introduction, was copied from that of the Irish Survey; and gentlemen who desire more precise information regarding that placed by the E. I. Company at my disposal, are referred to the last printed volume of the Researches of the Asiatic Society of Calcutta, 1831, wherein will be found the substance of a lecture which I delivered to that Society on the subject.

That lecture will explain the nature of the whole apparatus as it stood before use, and shortly after its arrival in India. It has since been used on four different occasions in the field, an account of which will appear in my next work, if I live long enough to complete and publish it, wherein will be described divers little convenient additions which experience has showed to be suited to the localities of India.

The principle, however, is quite unaltered; and Sir John Herschell need not, I presume, be informed by me that it involves two scales, each requiring reference to the unit of measure.

First: The iron standard of ten feet, to which the distance between the dots marked on the tongues is referred.

Second: The brass scale of six inches, to which the compound microscopes are referred; and if any precaution has really been omitted in establishing these two corrections, let us proceed to examine to whom the blame of such neglect is attributable.

The Court of Directors, at my recommendation, had two iron standard bars of ten feet, marked *A*. and *B*., as also two six inch brass scales, similarly characterized, constructed by Messrs. Troughton and Simms. These were just ready at the time I was making my preparations to leave the land of my birth, when I had to revise the sheets of my book then in the press, to attend to the trial measurement, to superintend the construction and dispatch of invoice upon invoice of new pattern instruments, recently made for my department, and to give directions about the supply of such later additions and improvements as were necessary to make my base-line apparatus on a par with Colonel Colby's.

This list may almost compare in length with, and was quite as distracting as, that of the projects contained in the Address signed by the thirty-eight learned Fellows; and as there is a point beyond which human endurance cannot be taxed, therefore it so happened that from absolute want of time, I could not compare my standards with those of Colonel Colby, which would have been the more difficult, as (unless my recollection fails me) the latter were at Dublin at the time.

I mentioned these facts to the Chairman, my excellent friend Mr. Loch, and obtained his sanction to leave the standards *B* of both the iron bar and brass scale in England; wherefore, under the full assurance from Captains Drummond and Murphy, and Mr. Simms, that they would take prompt and decisive measures to effect the necessary comparisons previous to the early dispatch of those duplicates to Calcutta, I deposited one of each, marked *B*, in the workshop of Messrs. Troughton and Simms, and caused only the two marked *A* to accompany me to India. I left England in June 1830, and it was not until the fall of the year 1834 that the standards *B* came to my Head Quarters in Upper India, whither they were dispatched immediately on landing. I have repeatedly made this a subject whereto to draw the attention of the Government of India, my only legal channel of correspondence with the India House; and there cannot be a

doubt that if in this period of more than three years any shadow of the interest now so vehemently expressed had actuated the learned Baronet, he might, on application to Mr. Simms, have attained the end in view, or if my assumption be groundless, and that learned gentleman really had in that long period a pure and disinterested wish to promote the branch of science which he now has led the world to believe that he so earnestly desires to patronize, one word from a person of his high fame, addressed to Dr. Wilkins, Captain Horsburg, Colonel Salmond, Mr. Loch, or Mr. Edmonstone, would certainly have sufficed to obtain for him access to those documents which contained the expressions of my regret at the delay, and my instances pointing to the urgency of the comparison.

I submit to your Royal Highness that it is really too much, after having neglected so fair an occasion (if indeed it has really been neglected, which I now see reason to fear is but too true), to call on the Court of Directors to send their standards on a second voyage across the sea for comparison; for what hope can be rationally entertained, that if this second opportunity were so complaisantly afforded, it would be availed of more than the first long interval, during which my department has been kept in suspense, and I have been buoyed up with the fallacious hope that all was in train to completion?

That all which depended on me has been faithfully effected will be made very plain if my work should ever see the light, for then not only the various parts of the process will be identically noted, but the modes of comparison, and the diverse arrangements and details of the apparatus will be fully explained, which I venture to surmise will then be pronounced by all persons competent to judge, as equally perfect in theory, and unobjectionable in the application; but as I do not desire to anticipate more than is necessary upon that work, which it is not usual to require of any person, I shall briefly state such particulars as are indispensable to substantiate what I here advance:

First: Iron standard bars *B* and *A* were compared by me and Captain Wilcox, 1834-5, by a numerous set of trials.

Second: Brass standard scales *B* and *A* were compared under my own eye, by competent persons of my instructing by a sufficiently numerous set of trials in 1835.

Third: The standard and measuring chains containing all that is known and all that is dubious of the old unit, as also many other chains, were compared in 1832 with ten lengths of the ten feet iron standard *A*, by Captain Wilcox and myself by a numerous set of trials.

I submit to your Royal Highness that the ground may now be considered clear of the subject of the unit of measure; that it is no longer to be questioned that all which lay in the power of the Court of Directors or me, their humble agent, has been attended to; and that it is unfair, most unfair, in the thirty-eight learned Fellows, and particularly in Sir John Herschell, to give to the world an Address which, though it does not deal in direct accusation, tacitly implies a censure of omission. What, if I left such an insinuation undenied, must my scientific brethren in foreign lands, or even my own countrymen who chance to read the Address, think of me, but that my work, which has cost me so much pains, is hollow to the core? What must be the first impression on the minds of the Court of Directors, in face of the recorded opinion of so many gentlemen so celebrated for their learning, but that I have neglected my business, and made a bad return for their confidence?

These impressions never could for a moment have been engendered if I had been present to speak for myself:—to my absence therefore they owe their origin; and since when, I pray your Royal Highness, has it become an English fashion of thinking, that absence is a sufficient plea for a multitude to combine to injure one?

We may proceed to the next point of the learned Baronet's recommendation, which relates to the thermometers; and here we shall find but little difference from what has preceded in my remarks on the comparisons of standards, for, with the exception of leaving the standard *B* in England, which was not done, and

fortunately not, as there is no reason to suppose that the measure would have been more profitable than on the occasion of the former, both cases are precisely similar.

Though it had not been the practice of my predecessor or myself prior to 1825 to compare our thermometers with any standard, yet when I returned to England in 1826 I found the necessity for such comparison was a generally received truth; and indeed, considering the intimacy between myself and Capt. Kater, Mr. Babbage and Mr. Troughton, and the frequent opportunities which I had of comparing notes with the well informed gentlemen with whom I have so often sat in the Council of the Royal Astronomical Society, it is hardly to be imagined that, wide-awake as I have always been, and disposed silently to treasure up all valuable hints, I should have been so insensible, as Sir John Herschell is pleased to suppose me, to what was passing, and what was for the benefit of my future operations.

To whom I originally owe the conviction of this necessity I would not take upon myself to say, for I do not remember; but this I can distinctly and positively state, unless my recollection misleads me most strangely, that I do not owe an idea on that or any other subject connected with my professional pursuits to Sir John Herschell.

However, it will be satisfactory to your Royal Highness to know that there were two standard thermometers, *A* and *B*, constructed by Messrs. Troughton and Simms in 1830, with which, since October of that year, all others, prior to use in the Great Trigonometrical Survey of India, have been compared, by suspending them side by side in a room closed during the night and opened in the morning for the purpose of having them read off; and if there be any more certain mode, it might have been more nationally honourable to have communicated it to me than to await the period when the portions of the work which most need delicacy were at an end, and the mischief arising from a faulty method had become irremediable. What are the learned Baronet's words in the Address? "To fix the zero errors of division

of all the thermometers used in every part of the process under Major Jervis's direction;" and is it not a legitimate conclusion, that herein all which Col. Lambton or myself had accomplished is destined to be swept off as rubbish, and as infinitely inferior in importance and accuracy to the wonders which Major Jervis is to bring to pass? It is manifest that to render my comparisons as complete as they can ever be it is necessary to compare my standards *A* and *B* with others in England—can Mr. Simms supply those data? Learned gentlemen who can go to Somerset House, can, it may be presumed, go to Fleeet-street and ascertain.

The only point in which Sir John Herschell speaks in this Address with a semblance of common respect for the accuracy of the Great Trigonometrical Survey of India, and the wakefulness of those who conduct it, is that wherein he advises that an arc of longitude comparable to Lambton's meridional arc should be measured trigonometrically; for therein he does, by using the words "if it has not already been done," admit the possibility that something may have been accomplished of which he is not aware, from the mere unaided mother-wit of those who rule India, and the humble instruments they employ.

This at least is condescension, such as it is; and considering the quarter whence it emanates, is deserving of encouragement; wherefore I solicit the favour of your Royal Highness to allow me to acquaint Sir John Herschell—that a Longitudinal Series, originating in the Sironj base, and terminated at Calcutta, was carried on during my absence in England by Mr. Olliver, an uncovenanted servant of the E. I. Company, then principal Sub-Assistant, and now chief Civil Assistant of the Great Trigonometrical Survey of India, under certain instructions which I drew up to meet the wishes of my superiors in authority before sailing for England in 1825:

That another Longitudinal Series, diverging from the side Burgapali to Baktapur, two stations just above the Beder base, (formerly written Boorgapilly and Baukthapoor,) was commenced

by me in October 1822, as it is notified would happen in the extract from Col. Lambton's report of that year, and has since been completed in very superior style by Lieut. Jacob, of the Bombay Engineers; a gentleman, who though seemingly unknown to Sir John Herschell, is highly esteemed for his talents practical as well as theoretical in my department, into which it is a high source of pride to me that I was instrumental to his introduction.

There is also a Longitudinal Series originating from Madras, which crosses the Great Arc Series, and unites the eastern and western coasts of the Peninsula, which was executed entirely by Col. Lambton some years before I joined the Great Trigonometrical Survey of India.

Of these, as far as bases are concerned, the first mentioned already depends on two bases measured with compensation bars, and is entirely disentangled from all connexion with the old unit; the second will, if I live to fulfil my intention, be also free from that dubious element, because, when the compensation bars shall have been employed in the measurement of a new base-line in the Beder Valley, the line Burgapali to Baktapur, being common to the series of the Great Arc and the Western Longitudinal Series, will also depend on the unit of reference of that apparatus; but then there will still remain another source of distraction; for the base of verification of this Longitudinal Series was measured with a steel chain by Dollond, in the Karleh plains, under the auspices of Capt. Shortrede and Major Jopp, whilst I was still in England, and unable to prevent the mischief taking place; and though I subsequently caused that chain to be sent round to Calcutta, and there compared it with my iron standard *A* in terms of which it is as well known as a chain can be, (so at least I think I have made it appear in the book which I have for some time been engaged in writing,) yet as I am one of those who think the steel chain a very uncertain implement of measurement, it will not be matter of surprise that I should for that and other causes look on the remediation of this as another

of the advantages likely to be derived from the course of instruction of Major Jervis by the learned Quartetto having compensation-bar measurements as one of its components.

As to the Longitudinal Series third in the order above enumerated, it obviously depends for its cure on the unit of former days; and as the learned Quartetto and Sir John Herschell in chief have displayed so ardent a desire to undertake the management of the affairs of the Great Trigonometrical Survey of India, it is most gratifying to me to be able to say, that I shall leave the ground quite free for them and their pupil to operate on, and that many of my present assistants will most probably see the prudence of following the same course.

Though I have sufficient sample of what little weight will be attached to any opinion of mine, yet it is but justice that I should state that, of the three Longitudinal Series, I am disposed to think those portions executed by Lieut. Jacob are by far the best —that Officer is an excellent observer, and distinguished for his facility of applying what he knows, which is of a high order, and of no small extent; and as the instrument which he has used (by Dollond) is a good one for its size, furnished with three microscopic micrometers to the horizontal circle, he has had greater advantages than were at the command of those who conducted the other parts of these three Longitudinal Series.

After the discussions respecting operations of this nature in Bouguer's work *Sur la Figure de la Terre*, and many others, but chiefly the later operations on the *Parallele Moyen*, it might, one would think, have been supposed, more especially as the measurement of arcs of longitude by the instantaneous extinction of blue lights is so palpably pointed out by Col. Lambton in the Asiatic Researches, and the experiments made by Capt. Drummond on the obscuration of his magnificent lights with this object in view, of which I was a spectator, it might, I submit to your Royal Highness, have been imagined that we were not all so fast sunk in somnolency and oblivion in India as to need having rockets pointed out to us as a possible scheme.

If originality of idea be claimed by Sir John Herschell in this case, I am truly sorry to be necessitated to disturb so pleasing a dream by holding a taper to the eyes of the dreamer, but in truth this is one of the subjects which was frequently discussed by Col. Lambton and myself; and rockets, mortars, explosion of powder, or fire balloons held by stay ropes, sudden extinction of blue lights, were too familiar to our thoughts to need being pointed out by the learned Baronet.

The most superficial examination will show immediately that, except in clear weather, rockets cannot be seen at twenty miles off with the naked eye,—that their flight is much more unsteady and uncertain than that of a shell fired perpendicularly from a mortar would be, and therefore they are more peculiarly liable to the objection which arises from the utter impossibility of bringing them at their instant of explosion into the field of a telescope of sufficient power,—an advantage, therefore, which is clearly all on the side of the explosion of powder, and the sudden extinction of a blue light, or, what is better, a Drummond's light standing in a fixed position on the Earth's surface.

Now the only weather in which we can at all calculate on meeting with very clear nights fit for observing terrestrial objects with the naked eye is the rainy season, which may be tried by those who choose in spite of experience to martyrize themselves; but the utter impossibility of succeeding in the unhealthy tract where the Northernmost or Calcutta Longitudinal Series runs, ought I think in common humanity to preclude that Series from any such abortive attempt, especially seeing that the firmament is at this season I speak of almost always obscured by clouds, which would frustrate all efforts to ensure accuracy of time, the very element most essential to make the result at all worth seeking.

Neither the Bombay nor Madras Longitudinal Series seems so objectionable on the score of unhealthiness as that of Calcutta; besides which, generally speaking, they both furnish longer distances; here therefore is an ample field; and when I have finished

my present business which detains me in India, and it is decidedly settled by experiment what method furnishes the best prospect of success, I shall watch the result with great interest, and only hope that sufficient precaution will be taken to avoid inaccuracy of registry, and jumping at conclusions, without which all the expense of money, labour, and human life will have been incurred in vain.

I remark, please you Royal Highness, that the learned Baronet proposes a sector as the fittest instrument for observing latitudes on these occasions; but it seems to have escaped his recollection, if indeed it was ever deemed worthy of his condescending regard, that the Court of Directors have had two three feet verticle circles constructed to supply the place of the zenith sector formerly used by Col. Lambton and myself. This is the less to be expected, as the subject is particularly adverted to in p. 3 of the Introductory remarks to my book, but it only furnishes one more instance in proof of what I have so often advanced, that it is quite useless to expect Learned Gentlemen will take the trouble to search for facts when their high fame enables them to dispense with such needless reference.

Now, at any rate, at each of the extremities of the total arc between which the difference of longitude is to be determined by observation of the phenomenon, the time must be known with extreme accuracy, which cannot be done without a transit instrument well sheltered; hence two transit instruments and a zenith sector are necessary appendages to the learned Baronet's scheme, besides two astronomical clocks.

The three feet circle answers the double purpose of observing transits and vertical arcs in the plane of the meridian for latitudes, so that by the use of these, one instrument, and that not the least cumbersome, would be eliminated. Thus, a reference to my book, p. 3, would have saved the learned Baronet from recommending an unnecessarily complicated and expensive machinery; for it is yet to be shown that complexity is an advantage; and perhaps if he will be so condescending as to look into

that book, there is no saying but he may find something else more or less worthy of his notice.

There is, of course, much more to be said on so prolific a subject as that in question than I can find room for; but it may be not out of place to add, that India is a country which, for all but the three months, November, December, January, is subject to storms as frequent and violent as capricious, which often prostrate whole camps and groves indiscriminately and unsparingly; whence it may be conjectured, that somewhat more than ordinary precaution and foresight is requisite on exposed hill-tops for the preservation of instruments so costly and delicate as those requisite to determine, in a manner worth a moment's thought, the elements of longitudinal arcs.

> Fair laughs the morn, and soft the zephyr blows,
> While proudly riding o'er the azure realm
> In gallant trim the gilded vessel goes.

In calm deep water, in short, where the surface is ruffled by a gentle breeze, land lubbers may be the crew, and the greatest lubber of them all may take the helm; but when the storm arises, and the way lies through shoals and breakers, it is not the loudest talker who can best bear the craft through in safety.

If Sir John Herschell had been seriously intent on advancing science in India, I submit to your Royal Highness, it is sadly to be lamented that he did not, as was at one time expected, pay a visit to the country of which he seems desirous to be scientific dictator; for let any human talents and acquirements be what they may, there is no disputing that a personal acquaintance with facts and localities is of immense advantage to obtaining an accurate notion of the best method of dealing with difficulties.

If the learned Baronet had taken this step as a prelude to offering recommendations *ex cathædrâ*, I can assure him that his march should have been a march of triumph, through lands which to Alexander of Macedon and his warlike array were as a closed book; but when he resolved on limiting his wanderings to

the half-way house, and made the glories of Wynberg, Hottentot's Holland, and Stellenbosch, the *Ultima Thule* of his mighty travels, he disappointed the expectations of his admiring countrymen in India, who (myself not last amongst the number) were prepared to greet his arrival with the most cordial reception their hospitality could offer.

Certainly no man has a right to complain of the learned Baronet for following the bent of his inclinations in this instance; but when on his return he proceeds to claim by proxy the implicit deference which would have been cheerfully paid to himself, and act as if, from the half-a-dozen Hindus and Mohammedans he may have seen at Kaap Stadt, he had acquired a right to judge of the whole population, climate, and circumstances of India, the mistake is one which it becomes high time to rectify.

I will now close this series of letters, and beg to assure your Royal Highness, that if in the ardour of discussion any expression may have fallen from me in any way exceptionable as far as your august person is concerned, it will be to me a subject of the deepest and most unfeigned sorrow.

Circumstanced as I am, there were in my opinion but two courses open to me—either to treat the whole matter with the silence it merited, or to take the subject up and be the assailant in my turn,—a middle course seemed unsuited to the occasion.

If the parties who were my unprovoked aggressors had been sufficiently insignificant, I might have adopted the former procedure as the most dignified; and I am disposed to hope that I should have had Christian charity sufficient to forgive and pity the weak effusion of their rude vanity; but when I remembered that those who had been so reckless of offending me were, as far as science is concerned, the magnates of the land, the very men whose fiat would have most weight, not only in my own native land, but in foreign countries, it is evident that this line was no longer open to me unless I would consent to be crushed to the earth, and forsake all pretension to the fair fame which my long enduring career has entitled me to.

That I have no personal animosity to any one of those gentlemen who have signed the Address, must, I think, have been manifest to all who remember me when I was last in England: and as to those of the learned Fellows to whom I am personally unknown, I expect to be believed when I say that it is not in my nature to forget myself so far as to enter unprovoked on an acrimonious discussion, or say what is offensive.

But between defending one's own hearth from aggression and trespass, and invading that of one's neighbour, the difference is wide indeed; and as I persuade myself that your Royal Highness's signature has been appended to the Address of which I complain, merely as a matter of form in your capacity as President, and at the instance of scientific advisers who have misled you, therefore I have chosen this method of appeal as the most consistent with the deference I owe to your high rank.

I have the honour to be, &c. &c.

GEORGE EVEREST.

FINIS.

C. Whittingham, Tooks Court, Chancery Lane, London.